PB89-225908

Superfund Record of Decision (EPA Region 5): Summit National Site Deerfield, OH. June 1988. First Remedial Action

(U.S.) Environmental Protection Agency, Washington, DC

Jun 88

U.S. Department of Commerce
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NTIS

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R05-88/068
June 1988

PB89-225908

EPA

Superfund Record of Decision:

Summit National, OH

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 11.5-acre Summit National site is a former coal strip mine in rural Deerfield Township, Portage County, Ohio, approximately 45 miles southeast of Cleveland. In the area immediately surrounding the site there are several residences, two landfills, a cement plant, a rollerskating rink, and a used tire storage lot. There are 9 residential wells within 1,000 feet of the site. Summit National Liquid Services operated a solvent recycling and waste disposal facility on the site from 1973 to 1978. Solvents, paint sludges, phenols, cyanide, arsenic, and other liquid wastes were stored, incinerated, and buried or dumped during site operations. All onsite media are contaminated with a variety of organic and inorganic compounds, and investigations indicate that offsite areas also are affected. In addition, about 900 to 1,600 buried drums and 4 buried tanks containing hazardous substances have been identified at the site. In June 1978, EPA ordered Summit National to stop receiving waste materials and remove all liquid wastes from the site. No waste was removed before the owner sold the site in March 1979. Because hazardous chemicals were leaking into the environment, in September 1979 EPA removed three bulk tanks and their contents (approximately 7,500 gallons of hexachlorocyclopentadiene) and contaminated soil, and treated some contaminated water. Surface operations were conducted between November 1980 and June
(See Attached Sheet)

17. Document Analysis a. Descriptors

Record of Decision
Summit National, OH
First Remedial Action - Final
Contaminated Media: gw, sw, soil, sediments
Key Contaminants: metals (arsenic, chromium), organics (PAHs, PCBs, phenols), VOCs (benzene, TCE, toluene, xylenes)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

Availability Statement	19. Security Class (This Report) None	21. No. of Pages 157
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16. ABSTRACT (continued)

1982, during which EPA removed drums, tanks, various surface debris, and a small amount of contaminated soil. In March 1987, EPA performed an emergency action to contain and terminate the actual or threatened release of hazardous materials due to the critically deteriorating site conditions. The primary contaminants of concern affecting soil, sediments, ground water, and surface water are VOCs including benzene, toluene, TCE and xylenes, other organics including phenols, PAHs and PCBs, and metals including arsenic and chromium.

The selected remedial action for this site includes: excavation and onsite incineration of approximately 32,000 yd^3 of contaminated soil and sediments and the contents of approximately 1,600 buried drums and 4 tanks, with disposal of incinerator residuals in an onsite RCRA landfill; ground water pump and treatment and onsite surface water treatment using precipitation, flocculation, coagulation, oil and water separation, filtration, and carbon adsorption, and discharge of treated water to downgradient surface water; installation of a RCRA cap over the site, with regarding and revegetation; construction of a slurry wall around the site perimeter; dismantling and onsite disposal of all onsite structures; limited access and deed restrictions; ground water and surface water monitoring; and residence relocation. The estimated present worth cost for this site is $25,000,000 with annual O&M of $1,132,250.

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Record of Decision
Summary of Remedial Alternative Selection
Summit National Site

SITE: Summit National - Deerfield, Ohio

STATEMENT OF BASIS AND PURPOSE

The selection of the remedy is based on the Administrative Record for the Summit National site. Attachment 1 contains the Responsiveness Summary, and Attachment 2 contains the index to the administrative record. The decision document represents the selected remedial alternative for the Summit National site. It was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan to the extent practicable.

The remedial action will require future operation and maintenance activities to assure the continued effectiveness of the remedy. These activities will be considered eligible for Trust Fund monies for a period not to exceed 1 year. With respect to restoration of ground or surface water quality, the operation and maintenance costs will be eligible for Trust Fund monies for a period of up to 10 years. I have also determined that the action being taken is appropriate, when balanced against the availability of trust monies for use at other sites. This Record of Decision addresses all operable units for remedial action at the Summit National site in Deerfield, Ohio.

DESCRIPTION OF THE SELECTED REMEDY

U.S. EPA's preferred alternative includes limiting access and future uses of the site; monitoring surface water and groundwater; removal of on-site structures, and placing debris in an off-site permitted landfill or under the multi-layer cap; excavating and onsite incinerating "hot spot" soils, sediments, buried drums and tanks including their contents; placement of all incinerated material in an on-site RCRA landfill; installation of a multi-layer cap over the entire site; a vertical barrier (slurry wall) around the perimeter of the site; the installation of wells over the site to extract and treat groundwater on-site; eliminating on-site surface water and treating it along with the groundwater treatment system; rerouting of the southern and eastern ditches to an area off-site; regrading and revegetating the site surface; and relocating the Watson residence to another area not affected by the site.

During the public comment period on U.S. EPA's Proposed Plan for the site, the Summit National Steering Committee (SNSC), representing 85 potentially responsible parties, made written proposals for a privately financed remedy at the site and have stated their intention to supply additional technical information supporting their proposals. U.S. EPA has addressed the SNSC comments in the attached Responsiveness Summary. It is possible that an agreement with the SNSC could be reached on a different, but comparable, remedy. In such case, additional public comments would be solicited, prior to finalizing a settlement with the potentially responsible parties, or amending this Record of Decision.

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan to the extent practicable, I have determined that the selected alternative for remediation of the Summit National site, is protective of human health and the environment; meets applicable or relevant and appropriate requirements; and is cost-effective.

The Ohio Environmental Protection Agency has been consulted throughout the Remedial Investigation, Feasibility Study, and Record of Decision process. This Record of Decision addresses all concerns at the site, and is the proposed final remedial action for the Summit National site.

This remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, and volume as a principal element, and utilizes permanent solutions and alternate treatment technologies to the maximum extent practicable. To ensure the long-term effectiveness and protectiveness of the selected remedy, a review will be conducted within 5 years after commencement of the remedial action.

June 30th, 1988
Date

Valdas V. Adamkus

Valdas V. Adamkus
Regional Administrator
U.S. Environmental Protection
Agency
Region V

Summary of Remedial Alternative Selection
Summit National Site

SITE LOCATION AND DESCRIPTION

The Summit National Site is located in Deerfield Township, Portage County, Ohio, approximately 45 miles southeast of Cleveland and 20 miles west of Youngstown (Figure 1).

The Summit National Site is approximately rectangular in shape and occupies approximately 11.5 acres. It is located at the southeast corner of the intersection of Ohio Route 225 to the west and U.S. Route 224 to the north (Figure 2).

The site was a coal strip mine and contained a coal wash pond and coal stock pile prior to its use as an incinerator site. The coal tipple remains as a 15 ft. high embankment in the northwest corner of the site with a loading dock and concrete debris remaining from the original coal processing facilities. Other prominent features on site are two ponds located in the midsection of the site, an abandoned incinerator and two buildings in the southeast corner, a scale house in the northwest corner, and two dilapidated buildings in the northeast corner. Additionally, it is estimated that approximately 900-1,600 drums and three known tanks and one suspected tank remain buried on site. Little vegetation is growing on site since most of the site was graded following periodic surface cleanup activities which were performed from 1980 through 1982. The site is enclosed by a 6 ft. high fence with two locked gates for entrance from Route 225.

The area immediately surrounding the site has been developed for a variety of uses, primarily rural residences, light industries and agriculture. Several residences are located to the north, east and west within 500 ft. of the site. A roller skating rink is immediately north of the site. Light industries in the area include a fuel distributor, a cement plant and manufacturer of septic tanks, two sanitary landfills, and used tire storage lots. Unused area near the site are either wooded or unvegetated strip mined lands.

SITE HISTORY AND ENFORCEMENT ACTIVITY

All information pertaining to site history was obtained from and based on the existing Summit National Remedial Action Master Plan (RAMP) (CH_2M Hill, August 1983) and the Ohio EPA files available from the Twinsburg, Ohio office.

In June 1973, Summit National Liquid Services obtained a "Permit to Install" an 18,000 gallon per month liquid waste incinerator from the Ohio EPA. In April 1974 an operating permit for the incinerator was issued by the Ohio EPA. The facility, called Summit National Liquid Services, received liquid wastes from various manufacturing and chemical companies. The wastes were either delivered in bulk using tanker trucks or in 55 gallon drums on flatbed trucks.

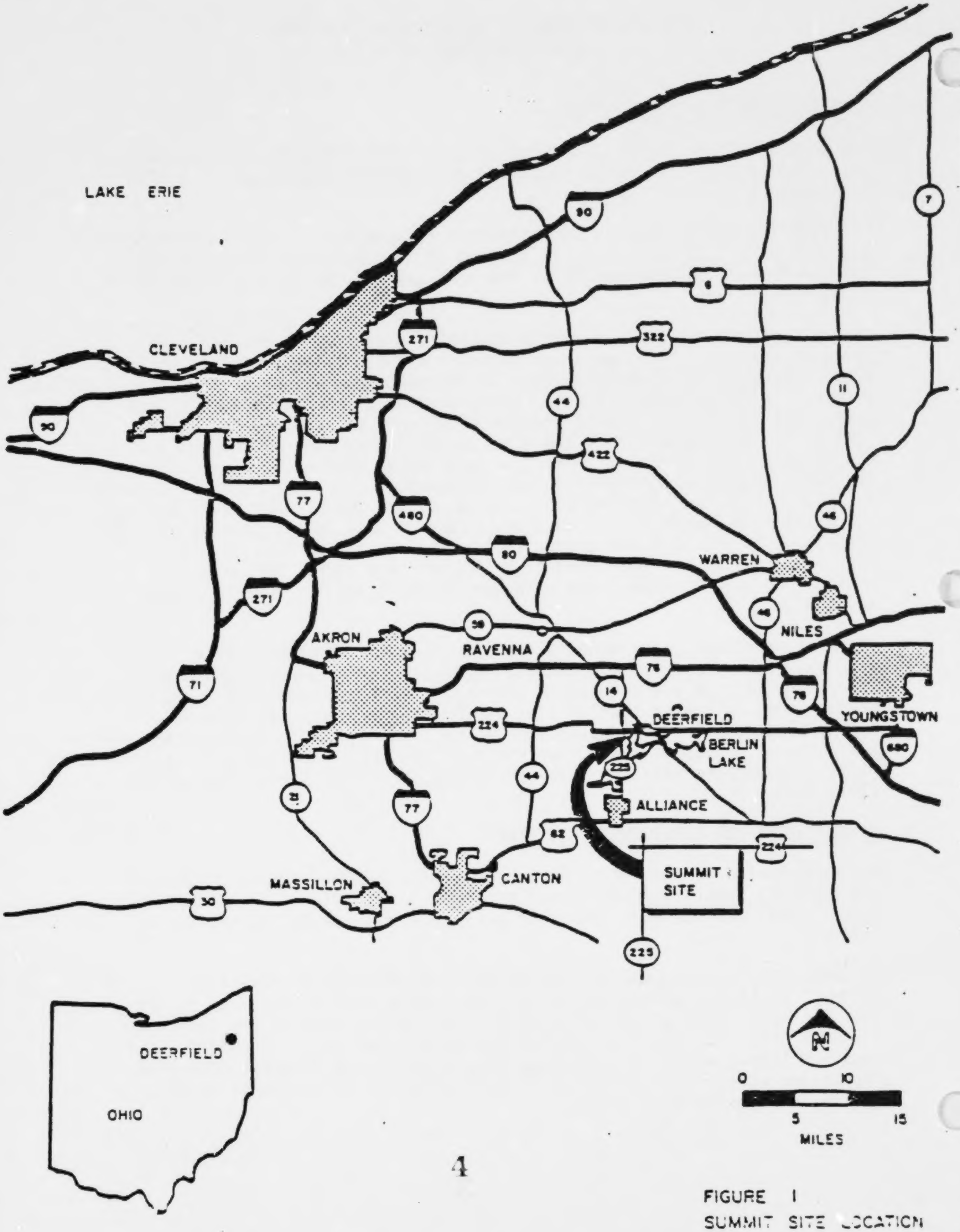

LAKE ERIE
CLEVELAND
90
271
6
322
44
11
7
422
77
480
46
80
WARREN
271
59
AKRON
RAVENNA
NILES
76
14
76
YOUNGSTOWN
71
DEERFIELD
224
BERLIN LAKE
680
225
44
ALLIANCE
21
77
62
224
SUMMIT SITE
MASSILLON
CANTON
30
225
DEERFIELD
OHIO
N
0
10
5
15
MILES

FIGURE 1

SUMMIT SITE LOCATION

SUMMIT NATIONAL FS

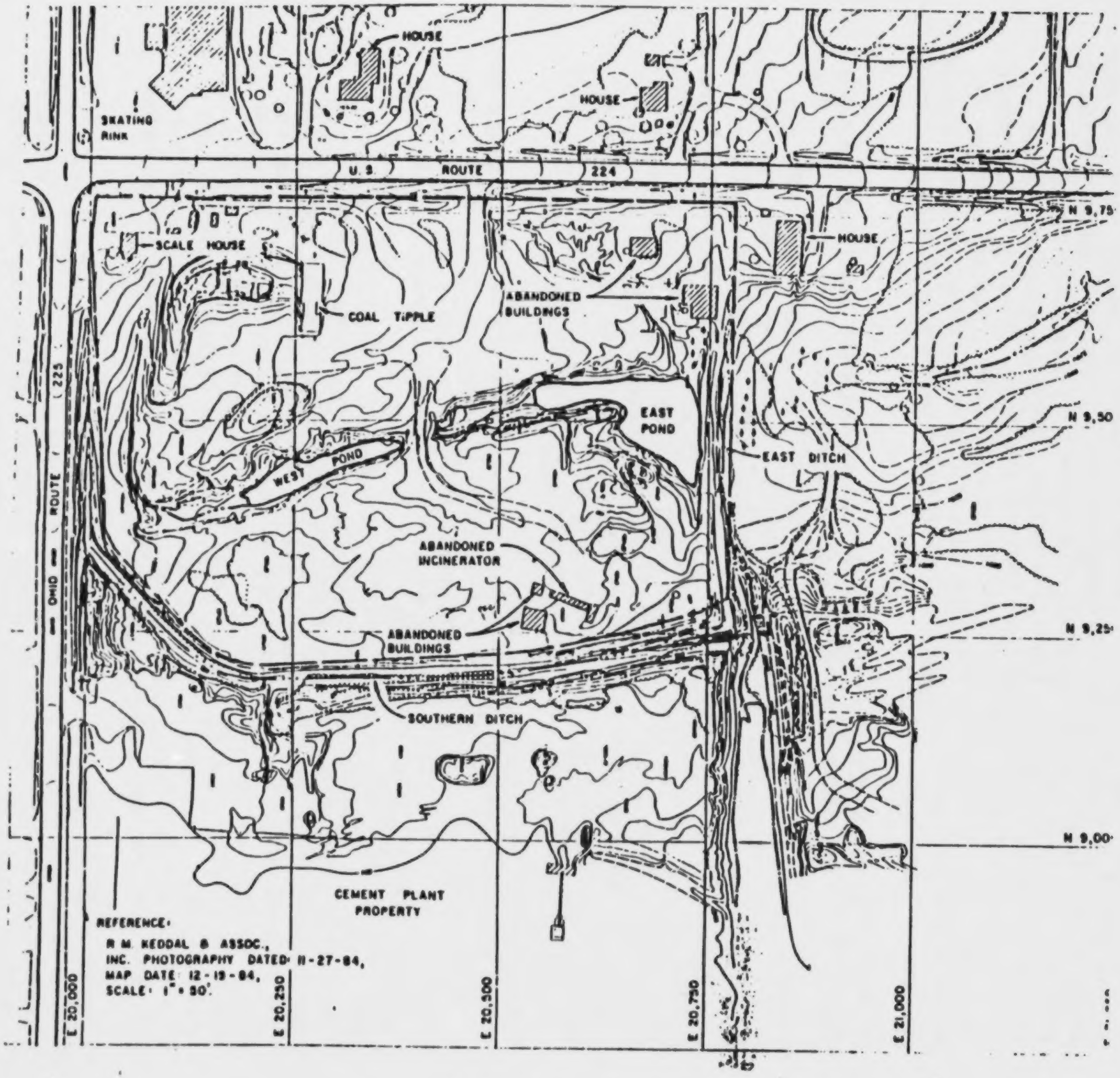

SKATING RINK
HOUSE
HOUSE
U.S. ROUTE 224
HOUSE
SCALE HOUSE
COAL TIPPLE
ABANDONED BUILDINGS
EAST POND
WEST POND
EAST DITCH
ABANDONED INCINERATOR
ABANDONED BUILDINGS
SOUTHERN DITCH
CEMENT PLANT PROPERTY
OHIO ROUTE 225
N 9,75
N 9,50
N 9,25
N 9,00
E 20,000
E 20,250
E 20,500
E 20,750
E 21,000
REFERENCE:
R.M. KEDDAL & ASSOC., INC. PHOTOGRAPHY DATED: 11-27-84, MAP DATE: 12-19-84, SCALE: 1" = 50'.

FIGURE 2
SITE MAP

Reproduced from best available copy.

Once brought to the facility, wastes were stored unprotected in 55 gallon drums, an open pit referred to as the polymer pit, or bulk tanks of varying size. Many wastes were mixed with flammable liquids and incinerated. Some wastes were buried on site, while others were dumped or leaked onto the site soil. The incinerator reportedly operated until 1978.

During its operating history, a variety of industrial wastes were disposed at the Summit National site. Drummed and tanked wastes disposed included waste oils, resins, paint sludges, flammable solvents, chlorinated solvents, plating sludges, pesticide wastes, phenols, cyanides, acids, various polymers, and lab packs. Many of the drums and bulk tanks stored on the surface leaked quantities of these materials into the surface of the site. It was reported that the concrete block pit was used for liquid waste mixing and solidification and overflowed on a recurring basis during periods of heavy rainfall.

In June 1975 the Northeast District Office of the Ohio EPA investigated a complaint of an unauthorized discharge of waste water from the site. The U.S. EPA conducted an investigation of the site on October 29, 1976 and found evidence of numerous leaks and spills. The owner was notified of the need for a Spill Prevention Control and Countermeasures Plan (SPCC) and informed that he was in violation of state laws relating to treatment and disposal of industrial waste. The Ohio EPA Director issued Final Findings and Orders on June 12, 1978. These required Summit National to cease receiving waste materials, remove all liquid waste from the site, and receive written approval prior to removing any material from the facility. No further waste material was received after this date. On March 15, 1979, the owner Mr. Georgeoff sold the site without removing any wastes.

In August 1979, the State of Ohio filed a complaint against the present and former owners alleging the operation of a solid waste disposal site without a permit, creation of a public nuisance, failure to comply with orders from the Ohio EPA, and installation of facilities for the storage and disposal of liquid waste without submitting plans to the Ohio EPA. Testing of onsite waste materials established the presence of over 7,500 gallons of a toxic chemical, hexachlorocyclopentadiene, commonly called HCCPD or C-56. In September 1979, U.S. EPA notified the owner that, because C-56 and other hazardous chemicals were leaking to the environment, remedial action was being planned pursuant to Section 311 of the Clean Water Act. The owner refused to take voluntary action or fund the cleanup operation, so U.S. EPA funded the cleanup of C-56 wastes that took place between September and November 1980. The remedial action consisted in disposing of three bulk tanks and their contents (approximately 7,500 gallons), some contaminated soil, and the treatment of contaminated water.

In November 1980, an agreement was reached between the State and eight generators that provided $2.5 million for surface cleanup. Surface cleanup operations, including removal of drums, tanks and various surface debris and a small amount of contaminated soil, were concluded in June 1982. The 1981-82 surface cleanup project removed much of the source of site contamination, but did not include subsurface exploration or cleanup.

In October 1981, the Attorney General of the State of Ohio (OAG) filed an action against the Potentially Responsible Parties (PRPs) under federal law using Section 107 of CERCLA. This suit is to recover past and future costs of removal and remedial actions at and about the site and to recover costs for damages to the natural resources of air, surface waters, groundwater and soils in and around the site. The status of this suit is on hold until the U.S. EPA finalizes the RI/FS document. However, the Judge in this case did have the first reported ruling that it was Congress's intent that CERCLA 107 liabilities are not only for future liabilities, but also past liabilities.

In June and July of 1982, the U.S. EPA and the PRPs negotiated the terms under which an Administrative Order by Consent could be signed allowing the PRPs to conduct and complete an RI/FS at the site. These negotiations were terminated due to the PRPs not accepting U.S. EPA's basic conditions.

In September, 1983, the Summit National Site was placed on the National Priorities List (NPL) which made it eligible for clean-up under the Superfund program. U.S. EPA issued a work assignment to conduct a Remedial Investigation (RI) and Feasibility Study (FS) for the Summit National site. The remedial investigation was conducted in two phases in Fall 1984 and Winter 1986.

In March 1987, the U.S. EPA issued a Section 106 (a) CERCLA Unilateral Administrative Order (AO) to the PRPs at the site. This AO was issued to contain and terminate the actual or threatened release into the environment of hazardous substances due to the deteriorating site conditions. It was observed in December, 1986 by U.S. EPA that the eastern pond on the site was flooding, the embankment about the pond was eroding and an underground tank was leaking. In March 1987, the site went critical due to the Spring rains and thaw. The PRPs informally agreed to reimburse U.S. EPA for response costs related to this emergency action rather than implement the AO. Currently, the U.S. EPA and the PRPs are finalizing a Section 122(h) CERCLA, as amended, Administrative Order by Consent that will reimburse U.S. EPA for the cost of completing the removal actions specified in the AO.

In November 1987, the U.S. EPA, State of Ohio, DOJ, OAG and PRPs started the legal Remedial Design/Remedial Action-Consent Decree negotiations at this site. These negotiations have made progress and are currently ongoing between all parties. After the Record of Decision is finalized technical components of the Consent Decree negotiations will commence under the Section 122(c) CERCLA, as amended, Special Notice Letter provisions.

COMMUNITY RELATIONS

Community involvement at the Summit National Site has been moderate. Residents and press have maintained an interest in U.S. EPA activities at the site.

An administrative record has been established for the Summit National site.

This record contains information regarding the Remedial Investigation, Feasibility Study, emergency activities and other historical and administrative information pertinent to the site. The record is located at the U.S. Post Office, 1365 Route 14, in Deerfield, Ohio. The U.S.EPA issued a press release announcing the availability of the proposed plan, Feasibility Study, and other site-related documents; location of the repository; the public comment period, February 12 to March 21, 1988; and the public meeting at the American Legion Hall in Deerfield, Ohio, on February 29, 1988. The index to the Administrative Record is in Attachment 2.

The public meeting was attended by about 150 interested parties, news media, and public officials. During the meeting the U.S. EPA presented the Feasibility Study. The presentation described the different alternatives considered for the site and the preferred alternative. Questions were answered and public comments were invited and accepted. The response to written comments received during the comment period are presented in the Responsiveness Summary, Attachment 1.

SCOPE OF RESPONSE ACTION

This record of decision addresses all affected media at the Summit National site. The scope of response action includes contaminated groundwater, surface and subsurface soils, surface water, sediments, buried drums and tanks. This record of decision is the only operable unit and is the final remedy for the Summit National site.

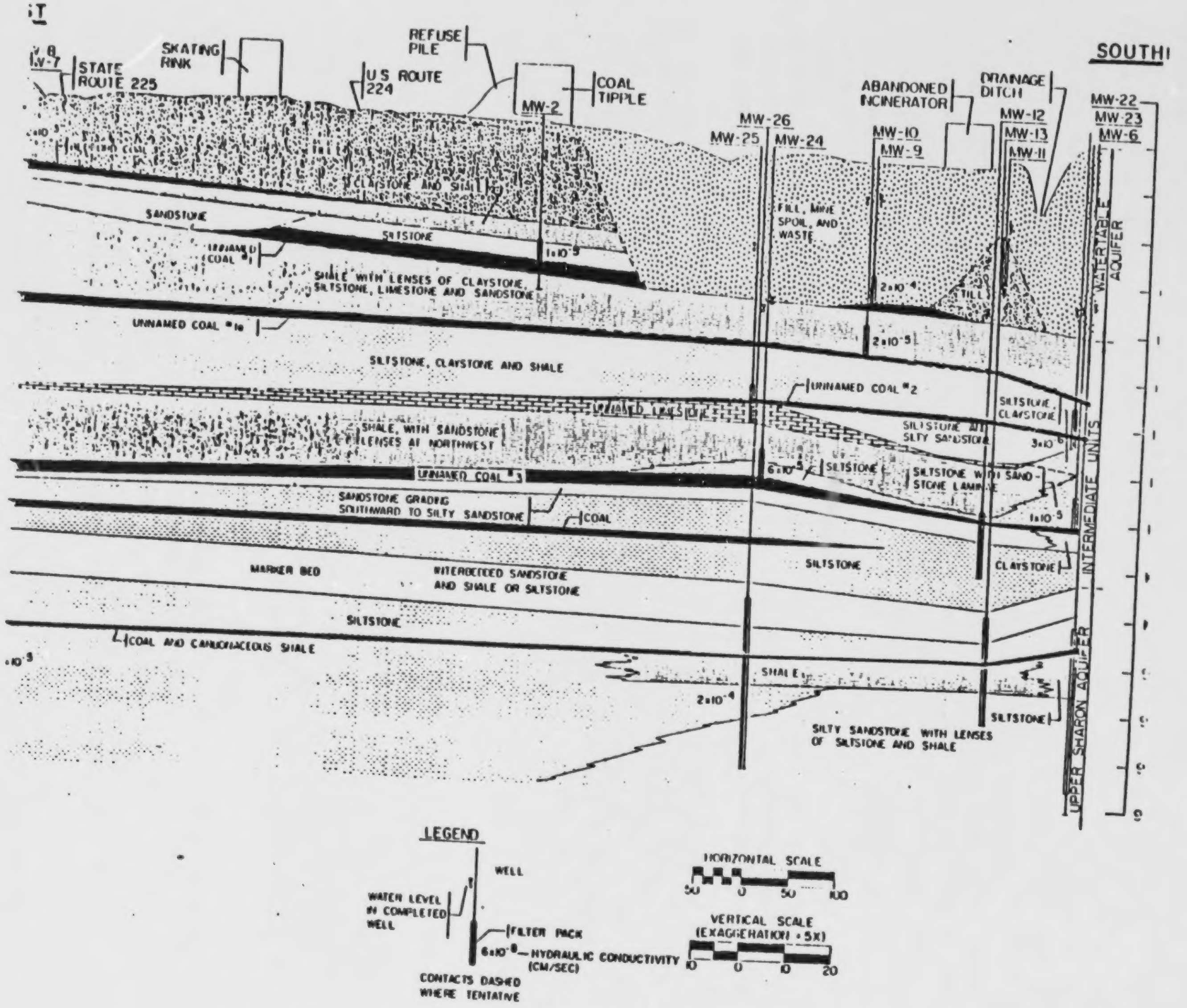
SITE CHARACTERISTICS

Results of U.S. EPA's Remedial Investigation at the site indicate that surface and subsurface soils, sediments, surface water, and groundwater beneath the site are contaminated with a number of organic and inorganic compounds. Samples taken off-site (south and eastern perimeter) have also been affected by site contamination. The following section presents the major findings and conclusions of the media sampled based on the result from the data obtained. A summary of the most representative organic and inorganic parameters for each media is presented in Attachment 3.

GROUNDWATER

The hydrogeology of the Summit National site is complex. For purposes of discussion and analysis, the strata at the site has been separated into three hydrogeologic units; the water table aquifer, the "intermediate" units, and the Upper Sharon "aquifer," as shown on Figure 3.

Groundwater in the water-table aquifer flows southward and eastward and does not vary much on a seasonal basis. The water-table aquifer is generally 5 to 12 feet below grade. The intermediate unit is separated into two stratas by an unamed limestone. The upper portion flows southeastward and the lower portion flows westward. Groundwater in the Upper Sharon flows northward.



SOUTH
STATE ROUTE 225
SKATING RINK
U.S. ROUTE 224
REFUSE PILE
MW-2
COAL TIPPLE
MW-26
MW-25
MW-24
ABANDONED INCINERATOR
MW-10
MW-9
DRAINAGE DITCH
MW-12
MW-13
MW-11
MW-22
MW-23
MW-6
CLAYSTONE AND SHALE
SANDSTONE
SILTSTONE
UNNAMED COAL #1
1x10⁻⁵
SHALE WITH LENSES OF CLAYSTONE, SILTSTONE, LIMESTONE AND SANDSTONE
FILL, MINE SPOIL, AND WASTE
2x10⁻⁴
TILL
UNNAMED COAL #1a
2x10⁻⁵
SILTSTONE, CLAYSTONE AND SHALE
UNNAMED COAL #2
SILTSTONE, CLAYSTONE
SHALE, WITH SANDSTONE LENSES AT NORTHWEST
SILTSTONE AND SILTY SANDSTONE
3x10⁻⁶
6x10⁻⁵
SILTSTONE
SILTSTONE WITH SANDSTONE LAMINAE
UNNAMED COAL #3
1x10⁻⁵
SANDSTONE GRADING SOUTHWARD TO SILTY SANDSTONE
COAL
SILTSTONE
CLAYSTONE
MARKER BED
INTERBEDDED SANDSTONE AND SHALE OR SILTSTONE
SILTSTONE
COAL AND CARBONACEOUS SHALE
SHALE
2x10⁻⁴
SILTSTONE
SILTY SANDSTONE WITH LENSES OF SILTSTONE AND SHALE
WATERTABLE AQUIFER
INTERMEDIATE UNITS
UPPER SHARON AQUIFER
LEGEND
WELL
WATER LEVEL IN COMPLETED WELL
FILTER PACK
6x10⁻⁶ — HYDRAULIC CONDUCTIVITY (CM/SEC)
CONTACTS DASHED WHERE TENTATIVE
HORIZONTAL SCALE
50 0 50 100
VERTICAL SCALE (EXAGGERATION = 5X)
10 0 10 20

FIGURE 3
GENERAL GEOLOGIC SECTION

Vertical gradients within bedrock vary across the study area. The gradient between the water-table aquifer and all deeper strata is downward at all locations. In bedrock, vertical components are upward at the southern portion of the site and downward in the central portion.

Shallow onsite groundwater in the water-table aquifer and uppermost intermediate units is contaminated with a number of organic compounds, including 2-butanone, phenol, toluene, and bis (2-ethyl hexyl) phthalate. The highest concentration of these contaminants occur in the southwestern quarter of the site and generally decrease across the southern half of the site, from west to east.

Of the deeper intermediate wells, levels of contaminants were detected in only one well, MW-24. Wells in the Upper Sharon aquifer do not present contamination problems. None of the residential wells, which represent water in the intermediate unit and Upper Sharon aquifer, indicated levels of organic contaminants above background. Background is defined as those parameters that occur within the natural range for the area in soils, groundwater, sediments, surface water, and air. Each media is compared to background levels present in the same media.

SOILS

The background soils representing local residential, farm and strip mine soil had detectable levels of numerous organic and inorganic compounds. The origins of these contaminants were not able to be determined from the data obtained during the RI. However, some inorganic compounds such as aluminum, arsenic, iron, maganese, and nickel are associated with coal and coal refuse, and therefore are naturally occurring in a coal mining area.

The onsite surface and subsurface soils (down to 8 ft.) were found to have levels of numerous organic and inorganic contaminants. Many of these contaminants were not observed off site, such as benzene, toluene, and phenol and some were found at levels up to several orders of magnitude above background. Soil levels were compared to an average background which included residential, farming and mining, and were also compared to residential alone. Both comparisons indicate the site is contaminated and has affected offsite soils. Offsite soils south of the site at the cement plant also contained numerous polynuclear aromatic hydrocarbons (PAH's) and other organics at levels above background. The eastern offsite soils also showed contamination, particularly PCBs, at levels that exceeded background concentrations.

SURFACE WATER

Surface water flow at and near the site was observed to occur only in response to seasonal precipitation events. Therefore, no reliable flow estimates or stream loading characteristics could be made. The onsite surface water was found to be contaminated with organic and inorganic compounds at concentrations above background. The east pond had consistently higher levels of contaminants than the west pond, based on total fraction concentration.

Offsite surface water is also contaminated with organics and metals at concentrations above background. The major areas of contamination are the south ditch (downstream) and the lower east drainage ditch (Figure 2).

SEDIMENT

Onsite sediments were found to be contaminated in all fractions analyzed based on concentrations that exceeded background soil concentrations and upstream sediment concentrations (not affected by the site). The west pond samples detected higher concentrations of contaminants in the organic fractions, while the east pond samples showed higher levels of inorganics. The offsite sediment in the southern ditch (upstream and downstream) and lower east drainage ditch were found to have organics that exceeded background. The first and second impoundments located off site to the southeast also showed minor contamination.

AIR QUALITY

The results of the RI indicated that the site emits low levels of VOCs to the air. However, the levels were far below Federal health and safety standards. U.S. EPA concluded that air contamination should not occur unless there is a surface disturbance at the site.

BURIED MATERIAL

Result of the buried materials investigation at the site indicate that five buried tanks and an estimated 900 to 1,600 drums are buried on site. Estimates indicate that the total number of drums existing intact that may contain waste can be 675 to 1,200. Out of five tanks, U.S. EPA removed one tank in Spring 1987. The tank contained several organic and inorganic compounds.

SUMMARY OF RISKS

As part of the RI process, a risk assessment was conducted to determine the potential risk the site may have on human health. The study concluded that unacceptable health risks (greater than 10^{-6} excess life time cancer risk) may occur under a number of exposures. The potential pathways of exposure are incidental ingestion and direct contact of soil, and consumption of contaminated groundwater in the shallow and intermediate water bearing units beneath the site.

Under current conditions exposure of on-site trespassers, offsite workers, and residents, to soils have an average risk which range between 1×10^{-8} to 3×10^{-6}. For the same exposure scenarios but under a plausible maximum case, the risks range between 2×10^{-4} to 4×10^{-5}. The maximum exposure scenario represents a potential for moderate exposure. The noncarcinogenic index is less than 1 for both scenarios and therefore, noncarcinogenic health effects are not likely to occur.

Exposure to sediments under current condition included offsite ditches and the second impoundment. The risk range for the average case is $2x10^{-7}$ to $6x10^{-2}$ and for the maximum case is $6x10^{-6}$ to $1x10^{-7}$. Carcinogenic health affects are not likely to occur under these scenarios with the exception of exposure to ditches under the maximum case. Noncarcinogenic health effects are not likely to occur since the hazard index is less than one.

Under future conditions, onsite workers and residents have a range of $1x10^{-5}$ to $2x10^{-7}$ under an average exposure scenario, and $5x10^{-3}$ to $2x10^{-4}$ under the maximum exposure scenario. The noncarcinogenic hazard index exceeds one under the onsite residents plausible maximum exposure scenario. These results represent a significant potential for carcinogenic and noncarcinogenic health effects.

Exposure to groundwater for onsite residents and workers for future conditions range between $1x10^{-3}$ to $4x10^{-9}$ under the average case, and $3x10^{-1}$ to $1x10^{-3}$ under the maximum exposure case. The noncarcinogenic hazard index for the water table exceeds one for both the average and maximum cases. The highest risks are associated with the water table aquifer, which represent a significant potential for both carcinogenic and noncarcinogenic health effects.

A summary of potential risks associated with the Summit National site is presented in Table 1.

DESCRIPTION OF ALTERNATIVES

The following assembled remedial alternatives represent a range of remediation applicable to the Summit National site. A cost summary is presented in Table 2. The detailed cost analysis for each alternative is presented in Attachment 4.

ALTERNATIVE 1 - NO ACTION

The Superfund program must evaluate the no action alternative to establish a baseline for comparison. However, at the Summit National site this alternative is not protective of human health and the environment as demonstrated by the conclusion of the Public Health Evaluation. Therefore, the no action alternative is not effective and eliminated from further consideration for this site.

ALTERNATIVE 2 - RESIDENT RELOCATION WITH MONITORING

This alternative includes access and deed restrictions, relocation of the Watson residence located on the eastern perimeter, runoff and groundwater monitoring. This alternative can be implemented within one year at a present worth cost of $820,000.

TABLE 1

SUMMARY OF POTENTIAL RISKS ASSOCIATED WITH THE SUMMIT NATIONAL SITE

Exposure Scenario	Total Cancer Risks		Noncarcinogenic Hazard Index	
	Average	Plausible Maximum	Average	Plausible Maximum
Current Conditions - Soil				
On-site trespassers	1×10^{-8}	3×10^{-5}	<1	<1
Off-site workers (southern perimeter)	6×10^{-7}	4×10^{-5}	<1	<1
Off-site residents (eastern perimeter)	3×10^{-6}	2×10^{-4}	<1	<1
Current Conditions - Sediment				
Children in ditches	2×10^{-7}	6×10^{-6}	<1	>1
Teenagers in second impoundment	6×10^{-12}	1×10^{-7}	<1	<1
Future Conditions				
On-site workers				
Soil	2×10^{-7}	2×10^{-4}	<1	<1
Groundwater				
Water Table	5×10^{-5}	3×10^{-2}	>1	>1
Intermediate Unit	2×10^{-5}	1×10^{-3}	<1	>1
Upper Sharon Aquifer	4×10^{-9}	NA	<1	NA
On-site residents				
Soil	1×10^{-5}	5×10^{-3}	<1	>1
Groundwater				
Water Table	1×10^{-3}	3×10^{-1}	>1	>1
Intermediate Unit	4×10^{-4}	2×10^{-2}	<1	>1
Upper Sharon Aquifer	8×10^{-8}	NA	<1	NA

NA = not applicable, only one representative sample.

ALTERNATIVE 3 - CAPPING AND OFFSITE DRUM INCINERATION

The major components of this alternative are: excavation and off-site incineration of the contents of buried drums and tanks; construction of a RCRA cap over the site to reduce contact with contaminated materials; construction of a soil-bentonite slurry wall to limit migration of contaminated ground water; lowering of the water table Aquifer by the use of 220 wellpoints; extraction of contaminated groundwater from the Upper Intermediate unit by 12 wellpoints; and access restrictions, monitoring, and resident relocation as described in Alternative 2. This alternative can be implemented within one year at a present worth cost of $15,000,000.

Groundwater extraction and treatment will be the same in subsequent alternatives.

ALTERNATIVE 4 - ONSITE RCRA LANDFILL FOR VADOSE SOIL

This alternative consists primarily of the same components, including off-site incineration of the contents of buried drums and tanks, as contained in Alternative 3, except that contaminated onsite soil within the vadose zone will be excavated and placed into a RCRA landfill constructed on site. As with Alternative 3, site fencing, deed restrictions and monitoring will be necessary since contaminants remain on site. This alternative can be implemented within a two to three year time period at a cost of $22,000,000.

ALTERNATIVE 5 - THERMAL TREATMENT OF "HOT SPOT" SOIL

This alternative consists of similar components as Alternative 3, with the additional excavation and onsite thermal treatment of approximately 32,000 cu. yds. of highly contaminated soil. This alternative had initially included the excavation and treatment of only 27,000 c.y. However, after further review, it was determined that an additional 5,000 c.y. would have to be removed and treated. The rationale for the additional soil volume is based on surface soil blocks exceeding the 1 X 10^{-5} upperbound cancer risk as depicted in Figure 4. The drum and tank contents would be treated on site in the mobile incineration unit. One incineration unit would be employed at the site and the duration of treatment would be approximately 5 years. Treatment residue from the onsite incinerator would be replaced in an onsite RCRA landfill. The time frame for this alternative is five years and has a present worth cost of $25,000,000.

ALTERNATIVE 6 - THERMAL TREATMENT OF VADOSE SOIL

This alternative includes components similar to Alternative 5, except that instead of treating only "hot spot" soil, all vadose soil determined to be contaminated, based on RI soil boring data, would be excavated and incinerated. A total of approximately 105,000 cu. yds. of soil would be excavated, incinerated onsite, and backfilled in the same manner as described in Alternative 5. Two incineration would be employed onsite and the duration of treatment would be approximately nine years. The present worth cost is $46,000,000 for alternative 6.

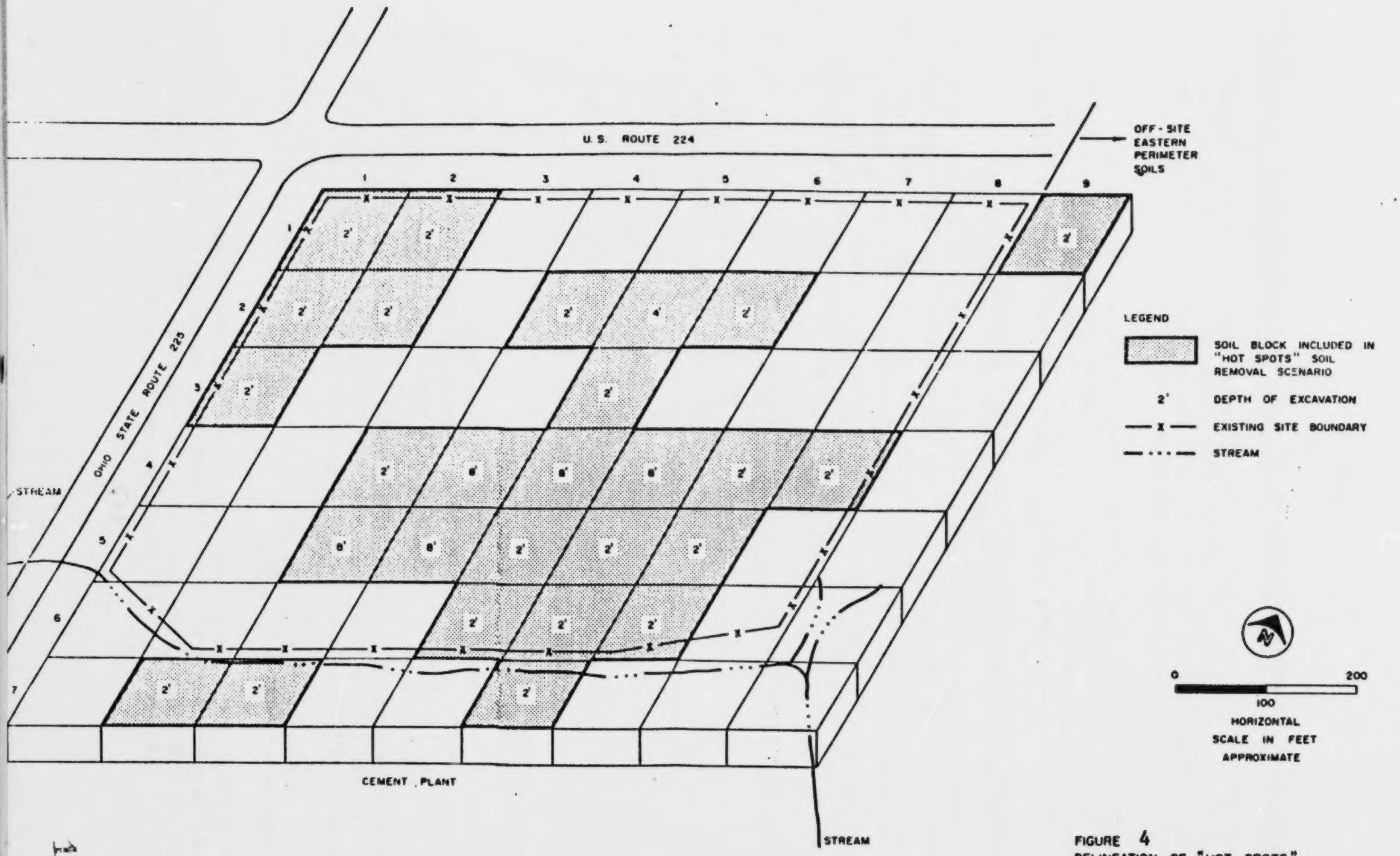

U.S. ROUTE 224
OFF-SITE EASTERN PERIMETER SOILS
OHIO STATE ROUTE 225
STREAM
CEMENT PLANT
STREAM
1
2
3
4
5
6
7
8
9
1
2
3
4
5
6
7
2'
4'
8'
LEGEND
SOIL BLOCK INCLUDED IN "HOT SPOTS" SOIL REMOVAL SCENARIO
2' DEPTH OF EXCAVATION
—X— EXISTING SITE BOUNDARY
—···— STREAM
0
100
200
HORIZONTAL SCALE IN FEET APPROXIMATE

FIGURE 4
DELINEATION OF "HOT SPOTS" SOILS REMOVAL SCENARIO
SUMMIT NATIONAL RESPONSIVENESS SUMMARY

ALTERNATIVE 7 - THERMAL TREATMENT OF ALL UNCONSOLIDATED MATERIAL TO BEDROCK

In this alternative, all contaminated, unconsolidated materials, including buried tanks and drums, all contaminated vadose soil, and all saturated unconsolidated materials associated with the contaminated portion of the water table Aquifer would be excavated and treated on site.

Contaminated soil and other unconsolidated materials amounting to approximately 430,000 cu.yds., would be treated on site using the thermal treatment system described in Alternative 5. Treatment of this material would require an estimated 12 years. The present worth cost is $127,000,000.

ALTERNATIVE 8 - IN SITU VITRIFICATION OF "HOT SPOT" SOILS

This alternative parallels Alternative 5 with the major difference being that in situ vitrification of "hot spot" soils are used as the soil treatment method, rather than onsite incineration. The onsite RCRA landfill would also be eliminated as the soils are vitrified in place. Buried drum and tank contents would be transported off site for thermal treatment. This alternative once in place can be completed within a two year time frame. The present worth cost is $29,000,000.

ALTERNATIVE 9 - IN SITU VITRIFICATION OF VADOSE SOILS

This alternative parallels Alternative 6 with the major difference being that in situ vitrification of the vadose soils is used as the soil treatment method, rather than onsite incineration. The onsite RCRA landfill would also be eliminated as the soils are vitrified in place. Buried drum and tank contents would be transported off site for thermal treatment. Rather than a multi-layer cap, the site will be covered with a simple soil cover at the completion of vitrification. Implementation can be achieved within seven years at a present worth cost of $39,000,000.

GROUNDWATER RESPONSE

The pump and treatment system is incorporated in Alternatives 3 through 9. The vertical barrier and pumping of the contaminated groundwater in both the shallow water table and intermediate unit would lead to restoration of the aquifer. Pumping in the intermediate unit is approximately 2 to 10 years to fully dewater the onsite water table aquifer. However, pumping will be perpetual for gradient control purposes. Cleanup of the intermediate aquifer could occur wuthin 5 to 10 years. These calculations are based on data collected during the RI which indicated a range of hydraulic conductivities values. The extraction system consists in the installation of 220 wells over the site on a 50 ft. grid system.

The treatment process will meet water quality standards and effectively protect human health and the environment. In absence of standards, discharge levels will obtain the best available technology economically achievable criteria. Treated water will be discharged to a surface water point located approximately 3500 feet downgradient of the site. The treatment system will include precipitation, flocculation, coagulation, oil and water separation, filtration, and carbon absorption. It is unlikely that any violations of air emissions of volatile compounds will occur. However, monitoring controls will be taken to assure compliance with air quality standards.

COMPARATIVE ANALYSIS OF ALTERNATIVES

The major objective of the FS for the Summit National site is to evaluate remedial alternatives, that are designed to remediate site contamination and associated problems. The evaluation criteria is consistent with the goals and objectives of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by Superfund Amendments and Reauthorization Act of 1986. The remedial alternative must effectively mitigate and minimize threats to human health, welfare and environment, be implementable, and cost effective.

The nature and extent of site hazards summarized in the Summit RI, form the basis for identifying specific objectives for remediating contaminated soil and subsurface wastes (buried drums and tanks), sediment, surface water, and groundwater and associated free product. The risks identified at the site in the public health risk assessment establish the basis for identifying site-specific goals of remedial measures.

The alternatives were screened based on their ability to protect human health and the environment; achieve State and Federal ARARs (applicable or relevant, and appropriate requirements); reduction in toxicity, mobility, and volume; long and short-term effectiveness; implementability; cost effectiveness; State and community acceptance. Based on screening and detailed analysis of remedial alternatives for the Summit National site, several assembled remedial alternatives, including the no action alternative, were developed.

A summary of the Detailed Analysis of Alternatives is presented in Figure 5. The purpose of the following section is to summarize the relative performance of the alternatives evaluation with respect to the criteria.

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The no action alternative and relocation/monitoring alternatives (1 and 2 respectively), do not provide adequate protection of human health and the environment. The relocation of the Watson resident removes the risk associated with exposure to offsite soils, but does not satisfy the overall protection criteria. Since these two alternatives do not satisfy the protectiveness criteria, they are eliminated from further consideration.

The remaining alternatives provide adequate protection, although they do so through different combinations of treatment, engineering, and institutional controls. All alternatives eliminate the exposure routes to any residual contamination which would result in eliminating any residual risks associated with the site.

aluation Criteria	ALTERNATIVE 1 No Action	ALTERNATIVE 2 Monitoring with Resident Relocation	ALTERNATIVE 3 Capping and Offsite Drum Incineration	ALTERNATIVE 4 Onsite RCRA Landfill for Vadose Soil	ALTERNATIVE 5 Thermal Treatment of "Hot Spot" Soil	ALTERNATIVE 6 Thermal Treatment of Contaminated Vadose Soil	ALTERNATIVE 7 Thermal Treatment of All Contaminated Material	ALTERNATIVE 8 In-Situ Vitrification of "Hot Spot" Soils	ALTERNATIVE 9 In-Situ Vitrification of Contaminated Vadose Soils
tion of Human Health and the ronment	Results in unacceptable health risks which exceed 10	Minimal protection by eliminating exposure to current conditions	Adequate protection by treating buried drums and tanks, ground water and surface water. Direct contact with contaminated soils and sediments is eliminated by the multi-layer cap.	Provides additional level of protection than Alternative 3 containing the vadose soil in an onsite RCRA landfill	Adequate protection by treating major sources of contamination, including onsite incineration of "hot spot" soils and containment of residuals	Same as Alternative 5, except additional volume of soils to be treated	Same as Alternative 6, except additional volume of soils to be treated	Adequate protection as in Alternative 3 with the additional treatment of "hot spot" soils by encapsulating contaminants	Same as Alternative 8 except additional volume of soils to be treated
liance with ARARs	Does not attain ARARs since site conditions are not altered	Same as Alternative 1	Attains ARARs	Attains ARARs	Attains ARARs	Attains ARARs	Attains ARARs	Attains ARARs	Attains ARARs
ction of toxicity, mobility and volume	No reduction to TMV	No reduction to TMV	Achieves reduction to TMV for buried drums and tanks, ground water and surface water. Reduction in mobility for soils is achieved by use of the cap.	Same as Alternative 3 with the additional reduction in mobility by enclosing vadose soils in RCRA landfill	Additional reduction to TMV by incinerating "hot spot" soils	Additional reduction to TMV over Alternative 5	Additional reduction to TMV over Alternative 6	Same as Alternative 3 except additional reduction in mobility is achieved by encapsulating contaminants	Additional reduction to TMV over Alternative 8
t-term Effectiveness	Not effective	Most effective since it achieves its response objectives within a short time frame	Same as Alternative 2.	The comprehensive excavation and handling of 105,000 cu. yds. of soil could result in short-term adverse effects	Short-term effects could occur due to excavation and incineration of drums and "hot spot" soils	Additional short-term adverse effects over Alternative 5 due to a longer time frame of 9 years	Least effective of all in the short-term due to the 12 year time frame	Short-term effects could occur due to the excavation of buried drums and tanks	Same as Alternative 8
-term effectiveness	Not effective	Not effective since site conditions are not altered	Provides long-term effectiveness. However, the untreated soils left on site may result in long-term management.	Provides a high degree of long-term effectiveness but requires long-term management	Same as Alternative 4	Same as Alternative 5 except a lesser amount of residuals are left behind on site	Offers the highest degree of long-term effectiveness since it destroys all affected media	Provides long-term effectiveness	Same as Alternative 6
mentability	Not applicable	Monitoring and relocation are technically implementable	Implementable, but with transportation and offsite RCRA capacity considerations	Same as Alternative 3, with the added difficulty of handling 105,000 cu. yds. of vadose soils	Implementability considerations are associated with handling and treating "hot spot" soils	Same as Alternative 5 except additional difficulties with handling and treatment a greater amount of soils	Least implementable due to the excessive amount of soils to handle (138,000 cu. yds.)	Implementability considerations are associated with the availability of units and reliability of this innovative technology	Same as Alternative 8
	$0	$420,000	$15,000,000	$22,000,000	$23,000,000	$46,000,000	$127,000,000	$23,000,000	$30,000,000
Acceptance[b]	Comments do not address this alternative	Comments do not address this alternative	Comments do not address this alternative	Comments do not address this alternative	Acceptance is uncertain based on comments received	Comments do not address this alternative	Comments do not address this alternative	Comments received but do not indicate a preference	Same as Alternative 8
ity Acceptance[c]	Unacceptable by the general community	Same as Alternative 1	No specific comments regarding this alternative	Same as Alternative 3	Acceptable by general community with some concerns regarding emissions resulting from incineration	No specific comments regarding this alternative	Same as Alternative 6	No comments regarding this alternative	Same as Alternative 8

Cost estimates are a present worth value based on a 30 year period at 10% interest

State acceptance is based on comments received during the RI/FS process and public comment period

Community acceptance is based on comments received during the public meeting and public comment period

Reproduced from best available copy.

Figure 5

SUMMARY OF DETAILED
ANALYSIS OF ALTERNATIVES
SUMMIT NATIONAL SITE

COMPLIANCE WITH APPLICABLE AND APPROPRIATE REQUIREMENTS

All protective alternatives are designed to attain the applicable and appropriate requirements of Federal and State environmental laws.

LONG - TERM EFFECTIVENESS AND PERMANENCE

Alternative 7, thermal treatment of all contaminated material down to bedrock, offers the highest degree of long-term effectiveness and permanence since it will destroy virtually all organic contamination present at the site. This alternative is very comprehensive in its scope and is extremely difficult to implement.

Alternatives 6 and 9 afford a high degree of long-term effectiveness and permanence by treating and immobilizing all currently known sources of contamination. While incineration would destroy the organic fraction, the containment of the inorganic fraction would be achieved by the installation of the double synthetic liner. The vitrification alternative, would encapsulate the contamination providing effective immobilization of both organic and inorganic compounds. Alternative 6 is as effective as alternative 9, but due to the liner, alternative 6 may have move intensive long-term management.

Alternatives 5 and 8 are equally effective but are less long-term effective and permanent than alternatives 6, 7, and 9. Alternatives 5 and 8 involve treatment of a lesser amount of contaminated soil, resulting in a greater amount of residual contamination. The remaining untreated soil would be properly contained by the multi-layer cap and any leachability of the soil would be collected by the leachate collection system. Leachate production will be minimal since the watertable will be maintained at a level below the residual contaminated soil. This alternative may require longer-term management than alternative 8.

Alternatives 3 and 4 are identical in the amount of material they leave behind to be managed over time. Alternative 3 provides a multi-layer cap which eliminates direct contact. Alternative 4 would, however, affords a slightly higher degree of long term effectiveness in that residuals would be disposed of in an onsite RCRA landfill. The landfill would include a double synthetic liner which would prevent leaching into groundwater.

REDUCTION OF TOXICITY, MOBILITY, OR VOLUME

Alternatives 5, 6, 7, 8, and 9 would all satisfy the statutory preference for treatment as a principal element. The remedy would address the principal threats at the site under each option.

Alternative 7, would involve thermal treatment of all unconsolidated material and is expected to destroy 100% of all contaminated material, therefore affording the highest degree of reduction in toxicity, mobility, and volume.

Thermal treatment will achieve a destruction and removal efficiency (DRE) of 99.99% for each individual principal organic hazardous constituent (POHC). When dioxins or PCBs are present, the DRE is 99.9999% for each POHC. The degree of overall reduction in TMV correlates to the volume of material that will be treated, which is greatest under alternative 7, and least under alternative 5.

Alternatives 8 and 9 involve in-situ vitrification which encapsulates contaminants thus immobilizing and preventing exposure to their toxicity. The overall reduction in TMV is greater in alternative 9 than under alternative 8.

Alternatives 3 and 4 involve treatment of drum and tank contents, which are equal in reduction of TMV. However, neither alternative addresses the highly contaminated soils so that the principal threats are not fully addressed by treatment.

SHORT - TERM EFFECTIVENESS

Alternatives 2 and 3 are most effective in the short-term in that they can achieve their respective response objectives in less than one year with no potential adverse impacts resulting from implementation activities.

Alternative 8, in-situ vitrification of hot spot soils could be implemented within a two year time frame, which is comparable to alternative 4 construction of a RCRA landfill. There are no anticipated potential adverse effects associated with implementation of vitrification. Alternative 4 requires the excavation and handling of contaminated soils which is technically more comprehensive and could result in short-term adverse effects.

Implementation of alternative 5, thermal treatment of "hot spot" soils is estimated at five years. This alternative could pose potential short-term effects due to excavation, materials handling, and possible air emissions.

Alternative 9, in-situ vitrification of contaminated vadose soils would require a seven year implementation time frame but is not expected to result in adverse impacts on workers, the community, or the environment.

Alternative 6, thermal treatment of vadose soils is estimated at nine years which could pose potential short-term effects. Alternative 7, thermal treatment of all unconsolidated materials, is the least effective of all alternatives in the short-term due to the 12 year time frame. This alternative has the highest potential for adverse impacts on workers, the community, and the environment.

IMPLEMENTABILITY

Alternatives 5 through 9 involve onsite remedial technologies which do not result in off-site complications. Alternatives 5,6, and 7, involve thermal treatment of approximately 32,000, 105,000, and 430,000 c.y. respectively. The implementability considerations associated with the handling and treatment of contaminated soils, construction of an onsite RCRA landfill, and the pumping of the groundwater, presents least implementability problems in alternative 5 and the most difficult in alternative 7.

In-situ vitrification is a less proven technology than thermal treatment. Implementability considerations with this technology for alternatives 8 and 9, include the availability of vitrification units, and the uncertainty over the technical feasibility in the specific waste matrix.

Alternatives 3 and 4 involve off-site thermal treatment of drums and tanks. The transportation and off-site disposal of hazardous materials may present difficulties with the availability of transportation services, and capacity of a RCRA facility. Alternative 4 is more difficult to implement than alternative 3 since it involves the additional handling of soils and construction of an onsite RCRA landfill.

COST

Alternative 7, thermal treatment of all unconsolidated materials, is by far the most costly alternative with a present worth cost estimated at $127,000.000. This compares to $46,000.000 for alternative 6, thermal treatment of the contaminated vadose soils, and $39,000.000 for alternative 9, in-situ vitrification of contaminated vadose soils.

Alternative 4, RCRA landfill of vadose soil; alternative 5 thermal treatment of "hot spot" soils; and alternative 8, in-situ vitrification of "hot spot" soils offer more comparable costs at $22,000.000, $25,000.000, $29,000.000 respectively. Capping with off-site incineration of drums and tanks under alternative 3 would cost $15,000.000.

STATE ACCEPTANCE

The State of Ohio has been consulted throughout the Remedial Investigation and Feasibility Study process. Based on discussions with by the Ohio Environmental Protection Agency plan on the RI/FS and proposed plan, the State concurrs with the selected remedial alternative at the Summit National site.

COMMUNITY ACCEPTANCE

The local community, in general, supports U.S. EPA's preferred alternative based on the comments received during the public comment period. Citizens were concerned with the quality of their drinking water and would like a residential monitoring program to be implemented by the U.S. EPA. Some concern were raised regarding air emissions from the incinerator. These concerns are adequately addressed in the Feasibility Study and will be adressed in the Responsiveness Summary.

TABLE 2

COST ESTIMATE SUMMARY AND TIME TABLE

Alternatives	Capital Cost	Annual O & M	Present Worth 30 yrs at 10%	Estimated Time At Completion
1. No Action	0	0	0	N/A
2. Resident Relocation with Monitoring	$ 150,000	$ 71,000	$ 820,000	< 1 year
3. Capping with offsite Drum and Tank Incineration	$11,000,000	$ 359,000	$ 15,000,000	< 1 year
4. RCRA Landfill for Vadose Soil	$18,000,000	$ 364,000	$ 22,000,000	2 - 3 years
5. Thermal Treatment of "Hot Spot" Soils	$13,000,000	$ 1,132,250	$ 25,000,000	5 years
6. Thermal Treatment of Contaminated Vadose Soils	$21,000,000	$ 4,083,500	$ 46,000,000	9 years
7. Thermal Treatment of All Unconsolidated Materials	$43,000,000	$12,187,000	$127,000,000	12 years
8. In-Situ Vitrification of "Hot Spot" Soils	$15,000,000	$ 5,178,700	$ 29,000,000	2 years
9. In-Situ Vitrification of Contaminated Vadose Soils	$12,000,000	$ 5,646,500	$ 39,000,000	7 years

Pumping is perpetual since its function is gradient control.

SELECTED REMEDY

Based on the evaluation of effectiveness, implementability, protectiveness, reduction of toxicity mobility, and volume, and cost of each proposed alternative, the comments received from the public and the Ohio EPA and the State and Federal environmental requirements, Alternative 5 - Thermal Treatment of "Hot Spot" Soil has been determined to be the most appropriate alternative. However, the selected remedy has been modified to include an additional volume of soil from 27,000 c.y. to 32,000 c.y. (See Alternative 5 on page 12). This results in an additional $1,000,000 for a total of $25,000,000.

This alternative provides adequate protection to public health and environment and significantly reduces the volume, toxicity, and mobility of contaminants. This alternative utilizes treatment technologies, permanent solutions to the maximum extent practicable, and is cost-effective.

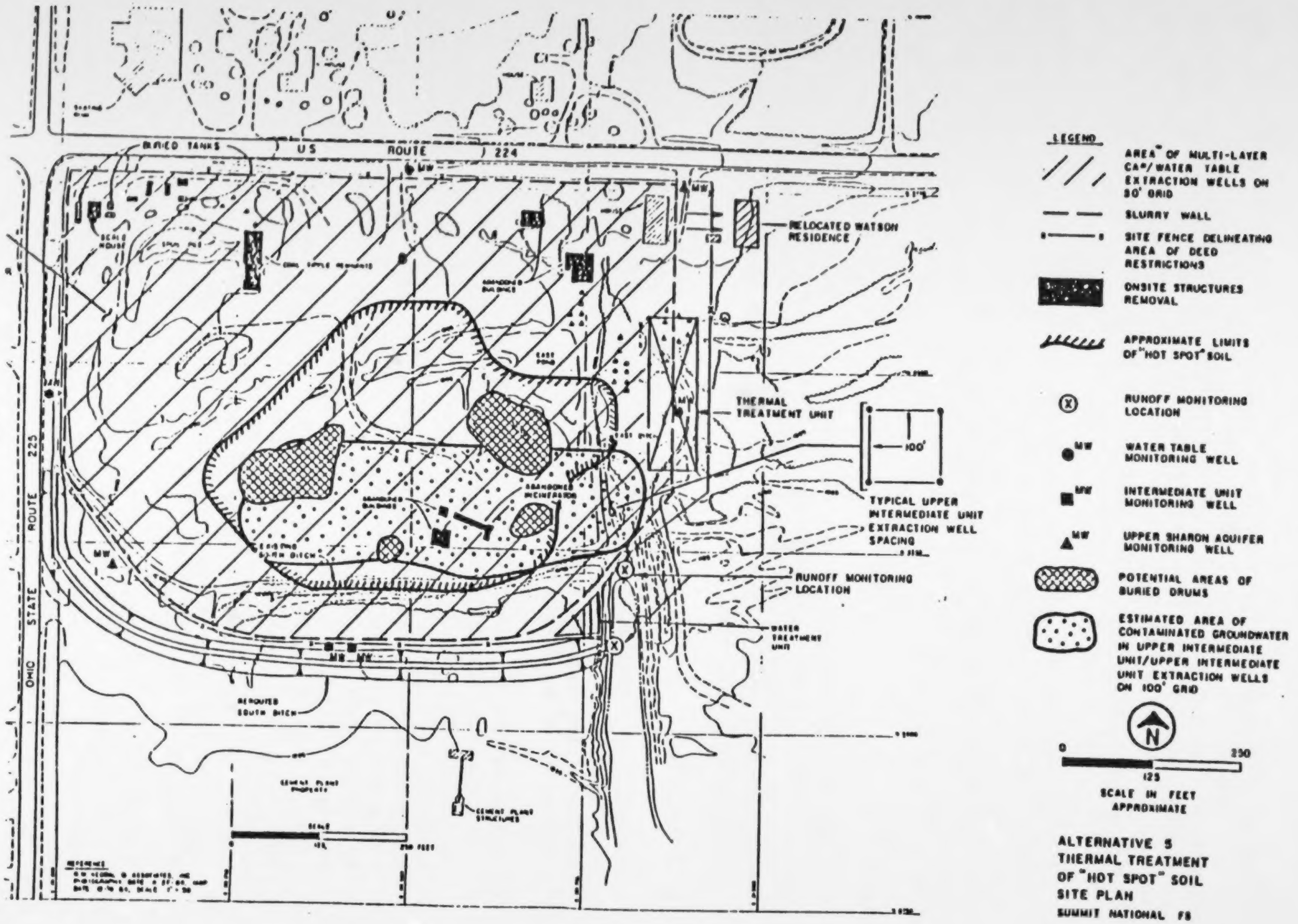
A site plan and cross section of Alternative 5 are presented in Figures 6 and 7 respectively. The components of the selected alternative are described as follows:

- Access and Deed Restrictions: A fence will be extended around the site perimeter to assure unauthorized personnel from interfering with ongoing remedial actions and preventing human and animal exposure to site contaminants. Deed restrictions are necessary to control the use of the property once the remedy is in place.

- Elimination of Onsite Surface Water: Surface water in both onsite ponds will be collected by mechical methods and treated prior to discharge. The south and east drainage ditch will be re-routed to an uncontaminated area beyond the site. Sediments excavated from the ditches will be treated along with onsite soils. Surface water in ditches will be treated prior to discharge.

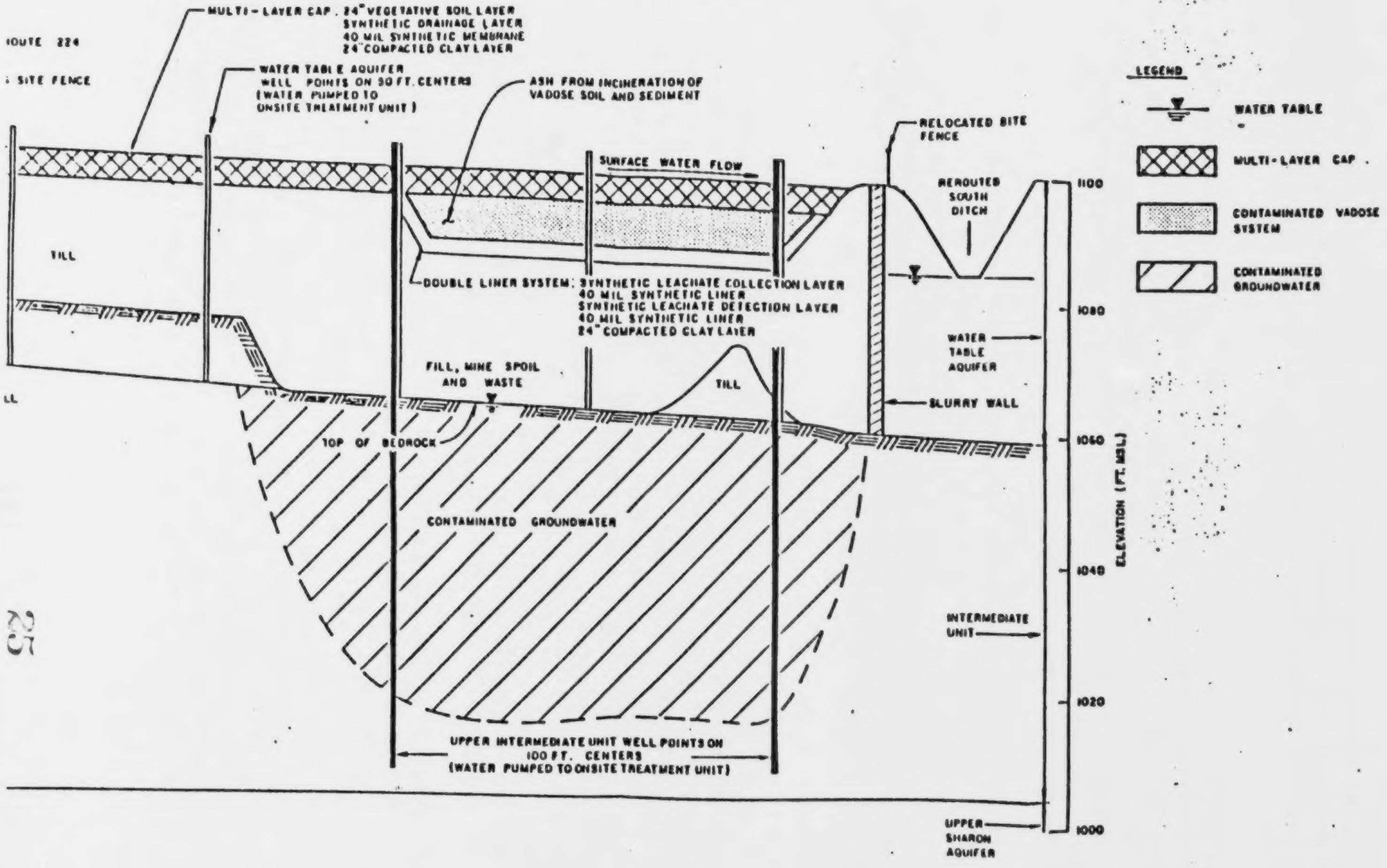
- Excavation and Incineration of Buried Drums, Tanks, "Hot Spot" Soils, and Sediments: A mobile incinerator will be assembled on-site to incinerate approximately 1,600 drums (88,000 gallons of waste), four tanks with volume ranging from 1,000 to 7,500 gallons of waste, 32,000 cubic yards of contaminated soils, including 1,500 cubic yards of contaminated sediments. Performance standards for incinerators of hazardous waste are designated in 40 CFR 264.343. The destruction and removal efficiency (DRE) for each principle organic hazardous constituent (POHC) is 99.99 percent, thereby providing level of assurance that other constituents are also being destroyed. For PCBs and dioxins the DRE is 99.9999% for each POHC. Incineration of waste can be completed within 5 years. Air monitoring will be conducted to assure no air quality standards are violated as a result of the excavation and incineration of soils, sediments, and drums.

- Installation of a Double Synthetic Liner: The incinerated material would be disposed of in an on-site RCRA landfill. This requires the construction of an underlying double synthetic liner. See Figure 8. The liner proposed satisfies EPA/530-SW-85-014, "Minimum Guidance on


BURIED TANKS
US ROUTE 224
OHIO STATE ROUTE 225
RELOCATED WATSON RESIDENCE
THERMAL TREATMENT UNIT
TYPICAL UPPER INTERMEDIATE UNIT EXTRACTION WELL SPACING
100'
RUNOFF MONITORING LOCATION
WATER TREATMENT UNIT
REROUTED SOUTH DITCH
EXISTING SOUTH DITCH
ABANDONED BUILDINGS
ABANDONED INCINERATOR
EAST POND
SCALE HOUSE
CEMENT PLANT PROPERTY
CEMENT PLANT STRUCTURES
MW
LEGEND
AREA OF MULTI-LAYER CAP/WATER TABLE EXTRACTION WELLS ON 50' GRID
SLURRY WALL
SITE FENCE DELINEATING AREA OF DEED RESTRICTIONS
ONSITE STRUCTURES REMOVAL
APPROXIMATE LIMITS OF "HOT SPOT" SOIL
RUNOFF MONITORING LOCATION
WATER TABLE MONITORING WELL
INTERMEDIATE UNIT MONITORING WELL
UPPER SHARON AQUIFER MONITORING WELL
POTENTIAL AREAS OF BURIED DRUMS
ESTIMATED AREA OF CONTAMINATED GROUNDWATER IN UPPER INTERMEDIATE UNIT/UPPER INTERMEDIATE UNIT EXTRACTION WELLS ON 100' GRID
N
0
125
250
SCALE IN FEET APPROXIMATE

ALTERNATIVE 5
THERMAL TREATMENT
OF "HOT SPOT" SOIL
SITE PLAN
SUMMIT NATIONAL FS

FIGURE 6



IOUTE 224
SITE FENCE
MULTI-LAYER CAP. 24" VEGETATIVE SOIL LAYER
SYNTHETIC DRAINAGE LAYER
40 MIL SYNTHETIC MEMBRANE
24" COMPACTED CLAY LAYER
WATER TABLE AQUIFER
WELL POINTS ON 50 FT. CENTERS
(WATER PUMPED TO
ONSITE TREATMENT UNIT)
ASH FROM INCINERATION OF
VADOSE SOIL AND SEDIMENT
SURFACE WATER FLOW
RELOCATED SITE
FENCE
REROUTED
SOUTH
DITCH
TILL
DOUBLE LINER SYSTEM: SYNTHETIC LEACHATE COLLECTION LAYER
40 MIL SYNTHETIC LINER
SYNTHETIC LEACHATE DETECTION LAYER
40 MIL SYNTHETIC LINER
24" COMPACTED CLAY LAYER
WATER
TABLE
AQUIFER
FILL, MINE SPOIL
AND WASTE
TILL
LL
SLURRY WALL
TOP OF BEDROCK
CONTAMINATED GROUNDWATER
INTERMEDIATE
UNIT
UPPER INTERMEDIATE UNIT WELL POINTS ON
100 FT. CENTERS
(WATER PUMPED TO ONSITE TREATMENT UNIT)
UPPER
SHARON
AQUIFER
1100
1080
1060
1040
1020
1000
ELEVATION (FT. MSL)
LEGEND
WATER TABLE
MULTI-LAYER CAP
CONTAMINATED VADOSE SYSTEM
CONTAMINATED GROUNDWATER

FIGURE 7

ALTERNATIVE 8 - THERMAL
TREATMENT OF "HOT SPOT" SOIL
GENERALIZED NORTH - SOUTH
CROSS SECTION
SUMMIT NATIONAL FS

Double Liner Systems for Landfills and Surface Impoundments, Design, Construction and Operation." Groundwater and Leachate monitoring will be required to evaluate the performance of the landfill.

- Removal of Onsite Structures: All onsite structures would be demolished or dismantled and disposed of onsite. Structures placed into an on-site RCRA landfill do not require decontamination as designated in 40 CFR 264.114.

- Installation of a Vertical Barrier: A soil-bentonite slurry wall approximately three feet thick would be constructed around the perimeter of the site to a depth of approximately 40 feet. This depth would include six feet of penetration into the bedrock to assure a good seal. The permeabilit of the slurry wall will achieve approximately 10^{-7} cm/sec. The slurry wall will prevent lateral migration offsite of groundwater and free product.

- Installation of Groundwater Extraction System: A network of 220 wells installed on a 50 ft. grid system over the site, and a pumping rate of 30 gpm was assumed. These figures will have to be refined by performing in-field pumping tests for final design. Twelve of the 220 wells will extract groundwater from the intermediate units. The extracted water will be treated onsite.

- Groundwater Pump and Treat System: The remediation for groundwater includes dewatering of the watertable aquifer and stagnating contaminant migration in the intermediate units. Clean-up of the intermediate unit can occur within 5 to 10 years. The groundwater pumping will be perpetual for gradient control purposes. The treatment will consist of physical treatment including precipitation, flocculation, coagulation, oil and water separation, filtration, and carbon adsorption. The effluent levels will attain Federal and/or State water quality standards. In absence of standards, discharge levels will attain the best available technology economically achievable criteria. It is unlikely that air emissions from the treated water will result, however the appropriate monitoring controls will be taken. The discharge point will be downgradient approximately 3500 feet southeast of the site.

- Installation of a Multi-layer Cap: A multi-layer cap would be installed over the site to prevent contact with surface soils and greatly reduce the volume of water infiltration through the unsaturated zone. Prior to placing the cap the site would be regraded to provide site drainage and prevent water from ponding on site. The layer would consist of one foot of top soil (loam), one foot of earth clean fill, filter fabric, high density polyethylene (HDPE) drainage net, and a two foot compacted clay layer. The multi-layer cap is in accordance with performance standards listed in 40 CFR 264.310. A RCRA cover design is site specific and the ultimate design will be determined during the remedial design phase. The diagram provided in Figure 9 is in accordance with RCRA guidelines.

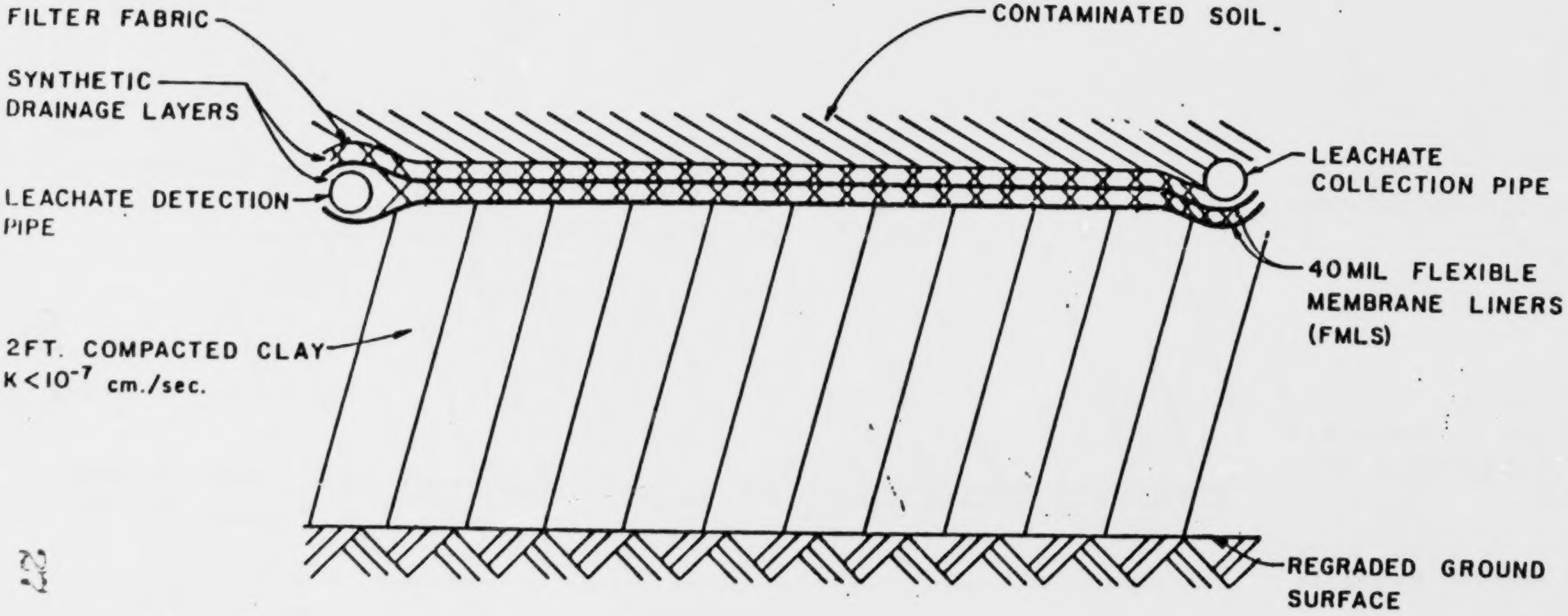

FILTER FABRIC
SYNTHETIC DRAINAGE LAYERS
LEACHATE DETECTION PIPE
2FT. COMPACTED CLAY
K<10^{-7} cm./sec.
CONTAMINATED SOIL.
LEACHATE COLLECTION PIPE
40MIL FLEXIBLE MEMBRANE LINERS (FMLS)
REGRADED GROUND SURFACE

FIGURE 8.
TYPICAL RCRA LANDFILL LINER
SUMMIT NATIONAL FS

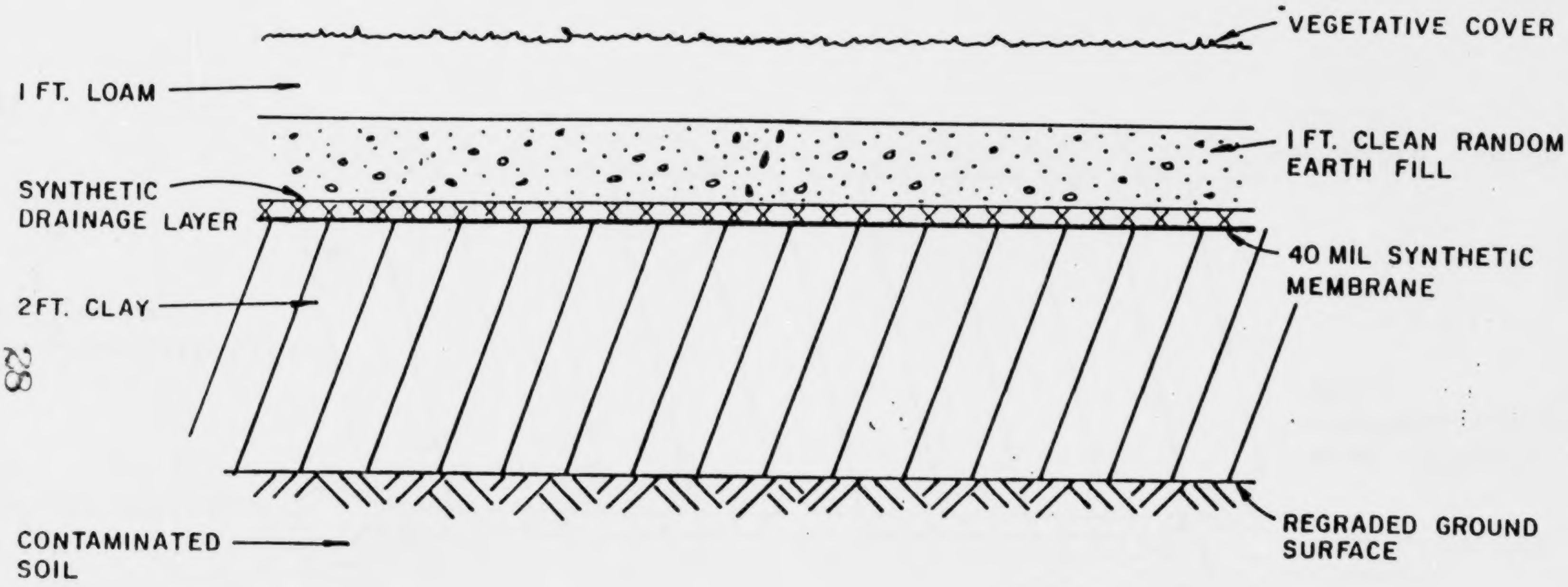

VEGETATIVE COVER
1 FT. LOAM
1 FT. CLEAN RANDOM EARTH FILL
SYNTHETIC DRAINAGE LAYER
40 MIL SYNTHETIC MEMBRANE
2 FT. CLAY
CONTAMINATED SOIL
REGRADED GROUND SURFACE

FIGURE 9
MULTI-LAYER CAP
SUMMIT NATIONAL FS

- Runoff Monitoring: Surface water and sediment samples will be collected and analyzed on a quarterly basis from the southeast discharge point. Monitoring will detect any migration of site contamination originating in soils and sediments. Monitoring will be an ongoing activity.

- Groundwater Monitoring: Groundwater in the watertable, intermediate, and Upper Sharon aquifer, will be monitored to detect any contaminant migration. Samples will be taken and analyzed on a quarterly basis at seven monitoring location points. Monitoring will be an ongoing activity for a minimum of 30 years.

- Relocation of the Watson Residence and Cement Plant Property: The installation of the slurry wall, multi layer cap, and rerouting of the southern and eastern drainage ditch, could not be completed due to the location of the Watson's and cement plant property. Additionally, there is a risk associated with soils that exceed 10^{-6} that also warrants remediation. Therefore, relocation of the Watson's residence and acquisition of the cement plant property are necessary to accomplish remediation at the site. The proper steps are being undertaken with the affected parties and appropriate agencies.

The 30 years present worth value for the selected alternative at a discount rate of 10 percent, is $25,000,000. The breakdown of the estimated cost is presented in Table 3.

STATUTORY DETERMINATIONS

Protection of Human Health and the Environment

The risks associated with direct contact with, or ingestion of surface and subsurface soils, and sediments will be eliminated by the installation of the multi-layer cap. Additionally, the contaminated soils referred to as "hot spots" will be treated and contained in an onsite RCRA landfill, which potentially eliminates migration into groundwater. Any leachate generated would be extracted and treated onsite.

Onsite incineration may result in short-term low level emissions of organics in the soil feed, and products of incomplete combustion. There will be an air emissions control system on the incineration to decrease particulate matter to the permitted levels. Thus, risks associated with inhalation will be controlled.

The components contributing to protection from groundwater associated risks include the installation of vertical barriers, groundwater extraction wells followed by treatment. The barrier reduces contaminated groundwater from migrating off-site, and in combination with the extraction system, it reduces the rate of downward contaminant movement. This remediation along with treatment decreases the long-term health risks associated with groundwater.

Elimination of surface water will eliminate intermittent exposure to surface water through ingestion or absorption. The surface water will be treated in the same manner as groundwater. Thus, risks associated with surface water will be eliminated.

The excavation of buried drums and tanks, and the demolition of on-site structures, may lead to short-term increases in fugitive dust and possible volatile organics which may lead into short-term health risks. Dust control measures would be employed during this task, thus mitigating the potential for health risks from exposure to dust.

The technologies under this alternative achieve adequate protection of human health and the environment. Access and deed restrictions, and institutional controls will ensure that no future action will interfere with the components of the remedial alternative, thus, assuring long-term protectiveness.

Attainment of Applicable or Relevant and Appropriate Requirements

The selected alternative is designed to meet Federal and State requirements that are applicable or relevant and appropriate. The requirements for the selected alternative, thermal treatment of "hot spot" soils, are presented in Table 4.

COST EFFECTIVENESS

The selected remedy represents the best balance across the evaluation criteria. It is U.S. EPA's policy to select a remedy which significantly reduces toxicity, mobility, and volume of hazardous constituents and minimizes long-term management.

The selected remedy for the Summit National site includes general site preparation, incineration, excavation and loading of contaminated material, a double liner system, a multi-layer cap, groundwater extraction and treatment system, and monitoring at a present worth cost of $25,000,000. The variable factors that significantly effect the relative cost differences between alternatives are in-situ treatment, the installation of the double liner system, and the volume of soils to be treated and handled.

Thermal treatment is a proven technology which can effectively destroy organic contamination at a reasonable cost. The amount of soils defined as "hot spot" soils equivalent to 32,000 c.y., is based on historical data, chemical concentrations, and estimated health risks and residual risks. The delineation of "hot spot" soils provides an increased level of protection reducing the upperbound lifetime cancer risk associated with the site from $2x10^{-4}$ to $2x10^{-5}$. This removal scenario represents the best balance between protectiveness, technical feasibility, and cost-effectiveness.

The costs associated with the double liner system are directly related to the volume of soils to be treated. The double liner system is a requirement and provides an increased level of protection by containing inorganic residuals in the treated soils. A detailed cost summary for the selected alternative is presented in Table 3.

TABLE 3

Cost Estimate Summary
Alternative 5
Incineration of Hotspot Soil

Reproduced from best available copy.

Item	Capital Cost	Annual O & M	Present Worth 30 Years O&M/Replacement 3%	5%	10%
I. GENERAL SITE PREPARATION					
Decontamination Facility	$14,000	$4,500	$24,000	$23,000	$20,000 *
Move Watson Residence	$21,000				
Extend Site Boundary	$20,000				
Extend Site Fence	$20,000	$1,000	$20,000	$15,000	$9,400
Reroute S. Drainage Ditch	$75,000				
Diversion Berm	$30,000	$5,000	$27,000	$25,000	$22,000 *
Demolition of Site Structures	$54,000				
Buildings for Incinerator	$120,000				
Soil Storage Building	$44,000				
II. INCINERATION					
Capital	$1,300,000				
Maintenance		$50,000	$270,000	$250,000	$220,000 *
Operation		$1,800,000	$9,800,000	$9,100,000	$7,800,000 *
III. EXCAVATION & LOADING OF CONTAMINATED MATERIAL					
Drum Excavation/Classification	$580,000				
Soil Excavation	$180,000				
Soil Handling and Loading	$200,000				
Backfill Ash and Compact	$170,000				
IV. DOUBLE LINER SYSTEM					
Clay Layer	$170,000				
Drainage System	$67,000				
HDPE Liner	$130,000	$3,000	$59,000	$46,000	$28,000
Geotextile	$46,000				
V. MULTI-LAYER CAP					
Clay Layer	$670,000				
HDPE Liner	$310,000	$5,000	$98,000	$77,000	$47,000
Drainage Layer	$220,000				
Vegetative Soil Layer	$580,000		$250,000	$180,000	$86,000 **
Revegetation	$20,000	$1,000	$55,000	$40,000	$21,000 **
VI. GROUNDWATER					
Slurry Wall	$690,000				
Wells in Water Table Aquifer	$1,200,000	$180,000	$3,500,000	$2,800,000	$1,700,000
Oil Skimmers	$90,000				
Wells in Upper Intermediate Unit	$82,000	$15,000	$290,000	$230,000	$140,000
5 Year Pump Replacement			$810,000	$610,000	$340,000
VII. WATER TREATMENT					
Total System 50 GPM	$250,000	$87,000	$1,700,000	$1,300,000	$820,000
VIII. MONITORING					
Onsite Laboratory	$400,000	$110,000	$600,000	$560,000	$480,000 *
Runoff Monitoring		$16,000	$310,000	$250,000	$150,000
Groundwater Monitoring	$32,000	$54,000	$1,100,000	$830,000	$510,000
CONSTRUCTION SUBTOTAL	$7,800,000		$19,000,000	$16,000,000	$12,000,000
Health and Safety (10%)	$780,000				
Bid Contigency (15%)	$1,200,000				
Scope Contingency (20%)	$1,600,000				
CONSTRUCTION TOTAL	$11,000,000				
Permitting & Legal (5%)	$550,000				
Services During Construction (8%)	$900,000				
TOTAL IMPLEMENTATION COST	$12,000,000				
Engineering & Design (10%)	$1,100,000 ***				
TOTAL CAPITAL COSTS	$13,000,000				
PRESENT WORTH			$32,000,000	$29,000,000	$25,000,000

* Present worth calculated over 5 yr. treatment period.

** Present worth calculated assuming replacement of 50% topsoil, regrading, and revegetating every 10 yrs.

*** Engineering and design costs do not include pre-engineered incineration unit.

TABLE 4

Compliance with Applicable or Relevant and Appropriate Requirements for the Selected Alternative at the Summit National Site

Requirement	Source of Regulation	Applicability or Relevance and Appropriateness
FEDERAL		
Resource Conservation and Recovery Act (RCRA)	RCRA Subtitle C, 40 CFR 260	RCRA regulates the generation, transport, storage, treatment, and disposal of hazardous waste. CERCLA specifically requires (in Section 104(c)(3)(B)) that hazardous substances from removal actions be disposed of at facilities in compliance with Subtitle C of RCRA.
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	RCRA Section 3004, 40 CFR 264 and 265	Regulates the construction, design, monitoring, operation, and closure of hazardous waste facilities. Subparts N and O specify technical requirements for landfills and incinerators, respectively.
Standards Applicable to Transporters of Hazardous Waste	RCRA Section 3003, 40 CFR 262 and 263, 40 CFR 170 to 179	Establishes the responsibility of offsite transporters of hazardous waste in the handling, transportation, and management of the waste. Requires a manifest, recordkeeping, and immediate action in the event of a discharge of hazardous waste.
EPA Administered Permit Programs: The Hazardous Waste Permit Program	RCRA Section 3005, 40 CFR 270, 124	Covers the basic permitting, application, monitoring and reporting requirements for offsite hazardous waste management facilities.
EPA Interim Policy for Planning and Implementing CERCLA Offsite Response Actions	50 FR 45933 November 5, 1985	Discusses the need to consider treatment, recycling, and reuse before offsite land disposal is used. Prohibits use of a RCRA facility for offsite management of Superfund hazardous substances if it has significant RCRA violations.
Hazardous and Solid Waste Amendments of 1984 (1984 Amendments to RCRA)	PL 98-616, Federal Law 71:3101	Specific wastes are prohibited from land disposal under the 1984 RCRA Amendments. This includes a ban on the placement of wastes containing free liquids. Also, solvent-containing wastes are prohibited from land disposal, effective November 1986. EPA is also required to set treatment levels or methods, exempting treated hazardous wastes from the land disposal ban. To date, these treatment standards have not been promulgated. The RCRA amendments will also restrict the landfilling of most RCRA-listed wastes by 1991 unless treatment standards are specified.
Clean Air Act (CAA)	40 CFR 1 to 99	Applies to major stationary sources, such as treatment units, that have the potential to emit significant amounts of pollutants such as NO_x, SO_2, CO, lead, mercury and particulates (more than 250 tons/year). Regulations under CAA do not specifically regulate emissions from hazardous waste incinerators, but it is likely that Prevention of Significant Deterioration (PSD) provisions would apply to an onsite thermal treatment facility.
National Environmental Policy Act (NEPA)	NEPA Section 102(2)(c)	CERCLA actions are exempted from the NEPA requirements to prepare an environmental impact statement (EIS) because U.S.EPA's decisionmaking processes in selecting a remedial action alternative are the functional equivalent of the NEPA analysis.
Intergovernmental Review of Federal Program	Executive Order 12372 and 40 CFR 29 (Replaces state and area-wide coordination process required by OMB Circular A-95)	Requires state and local coordination and review of proposed EPA assisted projects. The EPA Administrator is required to communicate with state and local officials to explain the project, consult with other affected federal agencies, and provide a comment period for state review.
Toxic Substance Control Act (TSCA)	40 CFR 761.60(a)(4)	Requires that materials disturbed or excavated which contain 50 ppm or greater PCBs be disposed at a landfill authorized under 40 CFR 761.75 or an incinerator authorized under 40 CFR 761.70.

TABLE 4
(con't)

Compliance with Applicable or Relevant and Appropriate Requirements for the Selected Alternative at the Summit National Site

Requirement	Source of Regulation	Applicability or Relevance and Appropriateness
National Pollutant Discharge Elimination System (NPDES) Permit	Clean Water Act Section 402, 40 CFR 122, 123, 125 Subchapter N	Regulates the discharge of water into public surface waters.
Toxic Pollutant Effluent Standards	40 CFR 129	Regulates the discharge of the following pollutants: aldrin/dieldrin, DOT, endrin, toxaphene, benzidine, and PCB's.
Conservation of Wildlife Resources	Fish and Wildlife Coordination Act	This act requires agency consultation prior to modifying any body of water.
Occupational Safety and Health Act (OSHA)	29 CFR 1910	Regulates working conditions to assure safety and health of workers.
Relocation Assistance and Property Acquisition	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1979, 40 CFR 4	Requires that property owners be compensated for property acquired by the federal government.
* Interim RCRA/CERCLA Guidance on Non-Contiguous Sites and Onsite Management of Waste and Treated Residue	U.S. EPA Policy Statement March 27, 1986	If a treatment or storage unit is to be constructed for onsite remedial action, there should be clear intent to dismantle, remove, or close the unit after the CERCLA action is completed. Should there be plans to accept commercial waste at the facility after the CERCLA waste has been processed, it is EPA policy that a RCRA permit be obtained before the unit is constructed.
* U.S.EPA Groundwater Protection Strategy	U.S.EPA Policy Statement August 1984	Identifies groundwater quality to be achieved during remedial actions based on the aquifer characteristics and use.
STATE AND LOCAL		
** State Hazardous Waste Site Permit	Ohio Solid and Hazardous Waste Disposal Law and Ohio Hazardous Waste Management Regulations. Ohio Revised Code: 3734-01 through 99 and Ohio Administrative Code 3745-50 through 69.	If a new hazardous waste facility must be created to handle the wastes for longer than 90 days, state approval and/or generator I.D. may be required as a precondition.
** Local Operating Permit or License for Remedy	Zoning, building or fire code, or local licensing laws.	Obtain local permit or license approving operation of site facilities.
** State Hazardous Waste Manifest and State Permit or License for Transport of Hazardous Waste	Ohio hazardous waste management, hazardous materials transport, or commercial driver licensing regulations. Ohio Administrative Code 3745-52, 53	In general, the manifest systems require the generator to obtain a permit to transport wastes on public rights-of-way within the state, to use only licensed transporters, and to designate only a permitted TSD facility to take delivery of wastes.

* These are not ARARS, however they will be applied as necessary.

** Permits are not required but nonetheless the conditions will be met.

TABLE 4
(con't)

Compliance with Applicable or Relevant and Appropriate Requirements for the Selected Alternative at the Summit National Site

Requirement	Source of Regulation	Applicability or Relevance and Appropriateness
** Local Approval of Grading (Erosion Control) Permit (Ohio has requirements for erosion control)	Local grading ordinances or erosion control ordinances.	Requirements affecting land slope and cover, surface water management, alteration of natural contours, or cover by excavation or fill.
** Local Approval of Use Permit	Local Building Code	Demonstration through presentation of evidence or onsite inspection that remedial action complies with the requirements of local health and safety laws and ordinances.
** Local Building Permits (includes electrical, plumbing and HVAC)	Local Building Codes	Obtain permits for construction.
** Ohio NPDES Permit	Ohio Water Pollution Control. Ohio Administrative Code 3745-33, 40 CFR 123.	Regulates all point source discharges to surface waters of the state.
** State Solid Waste Site Permit	Ohio Solid Waste and Licensing Requirements. Ohio Administrative Code 3745-27 and 37.	Regulations solid waste treatment, storage and disposal activities.
Ohio Water Quality Standards	Ohio Administrative Code 3745-1	Establishes minimum water quality criteria requirements for all surface waters of the state.

** Permits are not required but nonetheless the conditions will be met.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

All alternatives were carefully evaluated according to the evaluation criteria. After balancing the outcomes of the various alternatives, the selected remedy is the most appropriate solution for the Summit National site. This selected remedy provides permanent protection of human health and the environment from risks associated with soils, sediments, surface water and groundwater. Protection is achieved by utilizing alternative treatment system that destroys contaminants to non-hazardous levels. The long-term effectiveness is achieved within a 5 year time frame without causing potential risks. This remedy can be readily implemented at a reasonable cost and represents the practicable extent to which permanent solutions and treatment technologies can be utilized at the site.

Preference for Treatment as a Principal Element

The selected remedy addresses the principal threats posed by the site through the use of treatment technologies, thus satisfying the statutory preference for remedies that employ treatment as a principal element.

OPERATION AND MAINTENANCE

Several operation and maintenance (O&M) costs are associated with post closure activities after completion of the remedial action. The O&M costs were estimated on an annual basis over 30 years. The O&M for the selected alternative will require ongoing maintenance and monitoring of the onsite landfill and cap construction, groundwater extraction system, water treatment system (up to 12 years), runoff and groundwater monitoring. The O&M costs are presented in Table 3.

STATE AGREEMENTS

A financial agreement with the State of Ohio would be needed in the event negotiations with the potential responsible parties are unsuccessful. Section 104(c)(3) of CERCLA sets forth the State's financial responsibilities in remedial actions provided under CERCLA. The State financial responsibilities in the proposed remedial action would include payment or assurance of payment of 10% of the costs of remedial action, and assurance of all future O&M costs after the initial 1 year period of the remedial action. With respect to O&M costs for ground and surface water restoration, the State financial responsibilities would be incurred after an initial 10 year period.

The capital costs of the remedial action will be covered under a State Superfund Contract between the State and the U.S. EPA at the completion of design of the Remedial Alternative. The annual operation and future O&M costs will be covered under a Cooperative Agreement between the State and the U.S. EPA at the completion of design of the Remedial Alternative.

FUTURE ACTIONS

The need for any future actions for the Summit National site will be explored during pre-design. Pre-burn tests will be required to demonstrate the various type of thermal treatment processes that are applicable for the particular waste at the Summit National site. Pumping tests will be done to refine the exact location and numbers of extraction wells to enhance pumping of the watertable and intermediate aquifers. These pre-design actions and additional information will be used during the design, and cost estimates will be revised to reflect a more accurate cost for the project.

SCHEDULE

The following is a preliminary schedule estimated for implementation of the selected remedial alternative. This is a tentative schedule and is subject to change pending negotiations with the responsible parties, and unforeseen obstacles related to design and construction.

Approval of Remedial Action (Sign ROD)	June, 1988
Estimated Design Period	15 months
Complete Design	August, 1989
Advertise for Competitive Bids	September, 1989
Open Bids	October, 1989
Contract Award	November, 1989
Notice to Proceed	December, 1989
Estimated Construction Period	5 years
Construction Complete	December, 1994

Attachment 1 - Responsiveness Summary

RESPONSIVENESS SUMMARY
SUMMIT NATIONAL SITE
DEERFIELD, OHIO

The U.S. Environmental Protection Agency (U.S. EPA) held a public comment period from February 12, 1988 through March 21, 1988, for interested parties to comment on U.S. EPA's Feasibility Study and Proposed Plan (dated February 12, 1988) for the Summit National Site. During the public comment period, the U.S. EPA held a public meeting at the American Legion Hall in Deerfield, Ohio, on February 29, 1988. The purpose of the public comment period is to provide an opportunity for citizens, state and local officials, Potentially Responsible Parties (PRPs) and other interested and affected parties, regarding the selected remedial alternative for the Summit National Site. This Responsiveness Summary summarizes the major issues raised by the public and addresses them as part of the Record of Decision (ROD) process.

The Responsiveness Summary is divided into three major sections that address general and specific comments received from the Public, State, and PRPs.

I. Public Comments on the Remedial Alternatives - Community Concerns

Nine community groups submitted written comments to U.S. EPA during the public comment period: Kent Environmental Council, Deerfield Township, Citizens Actively Protecting Sites, Mrs. P. King, Mrs. A. Turnball, Mr. and Mrs. Huchok, Mr. T. Edward, Mr. R. Ringen, and Mrs. Doris Carver.

The comments are organized and addressed according to the following categories:

A. Start-Up of Remedial Action

Comment:

In general, the community is concerned that one and one half years is too late to start cleaning up the Summit National Site. They request that U.S. EPA initiate the clean-up as soon as possible and that the removal of drums be the top priority.

U.S. EPA's Response:

Once the remedial alternative is selected and finalized with the signing of the ROD, U.S. EPA is required by the law to notify the Potentially Responsible Parties (PRPs) and reach an agreement within 120 days that will provide the PRPs the opportunity to undertake the selected remedy. If negotiations with the PRPs fail, then U.S. EPA will fund the clean-up while litigation continues. The average time frame for a complex site such as Summit National, is approximately 15 months. The Summit National Site is a very complex project and any remedial action must be designed and planned carefully to avoid any adverse impacts during its implementation. The selected alternative does include the removal of drums. Currently, drum contents are not migrating from the site. In the event that drums are suspected of leaking and threatening water supplies at any time prior to implementation of the selected remedial action, U.S. EPA has the authority to take action. U.S. EPA is currently considering a monitoring program to detect such an event. This proposed monitoring program would be in operation until and during remedial action at the Summit National Site.

B. Emission Controls on the Incinerator

Comment:

An environmental group questioned if the proposed incinerator had any emissions control.

U.S. EPA's Response:

The on-site incinerator will be designed so that all applicable requirements, State and Federal regulations listed on Table 6-1 of the Feasibility Study (FS) and Table 4 of the Record of Decision will be met (i.e., Resource Conservation and Recovery Act (RCRA), Clean Air Act). The emission control system for an incinerator typically consists of a gas scrubber system and a particulates scrubber system as shown on the attached schematic (Figure 1). Exhaust gases from the kiln enter a secondary chamber afterburner operating at temperatures between 1400°F and 2400°F to complete oxidation of the combustible waste. Prior to release to the atmosphere, exhaust gases from the afterburner pass through air pollution control units for particulate and acid gas removal. All of the existing mobile rotary kiln systems use a scrubber as part of their air pollution control system. General operating standards for incinerators treating hazardous waste are outlined by federal regulations contained in 40 CFR 265, Subpart O of RCRA (FIGURE 1).

C. Groundwater and Surface Water Treatment Process

Comment:

Local environmental groups questioned whether the treatment process and if such process complies with water quality standards and the Safe Drinking Water Act.

U.S. EPA's Response:

The surface water and groundwater treatment system will be designed to remove both organic and inorganic contamination. This system will include physical and chemical treatment technologies. The used activated carbon units resulting from the treatment process will be disposed as a hazardous waste according to federal hazardous disposal standards. The treatment process itself is not regulated by the Safe Drinking Water Act since its effluent is not a drinking water source. The discharge of the treated water will meet the water standards or limits set forth under the National Pollution Discharge and Elimination System. The treatment system could cease to operate once the upper intermediate aquifer is restored in approximately 5 to 10 years based on data obtained during the Remedial Investigation (RI). Standards under the Clean Water Act would have to be met at this time.

D. Concerns About Drinking Water Supplies
Comment:

Many citizens are unhappy about the existence of dumps in the area and how it is affecting their residential wells. One resident requested a Federal and State grant to install an alternate water supply to residents in Deerfield, Ohio.

U.S. EPA's Response:

The U.S. EPA gives high priority to cleaning up facilities where the release of hazardous substances has contaminated drinking water supplies. The Summit National Site has released contaminants into the groundwater, but has not affected the surrounding residential water supplies. If these residential wells become affected by the site, then U.S. EPA has the authority to evaluate response actions that may include a provision for an alternate water supply. The proposed groundwater monitoring program would detect contaminant migration to local residential wells. The Ohio Department of Health (ODH) is currently developing a protocol to address individual requests for private well sampling. Citizens interested in finding out more information about ODH's efforts, should contact that agency.

E. Who are the Responsible Parties?
Comment:

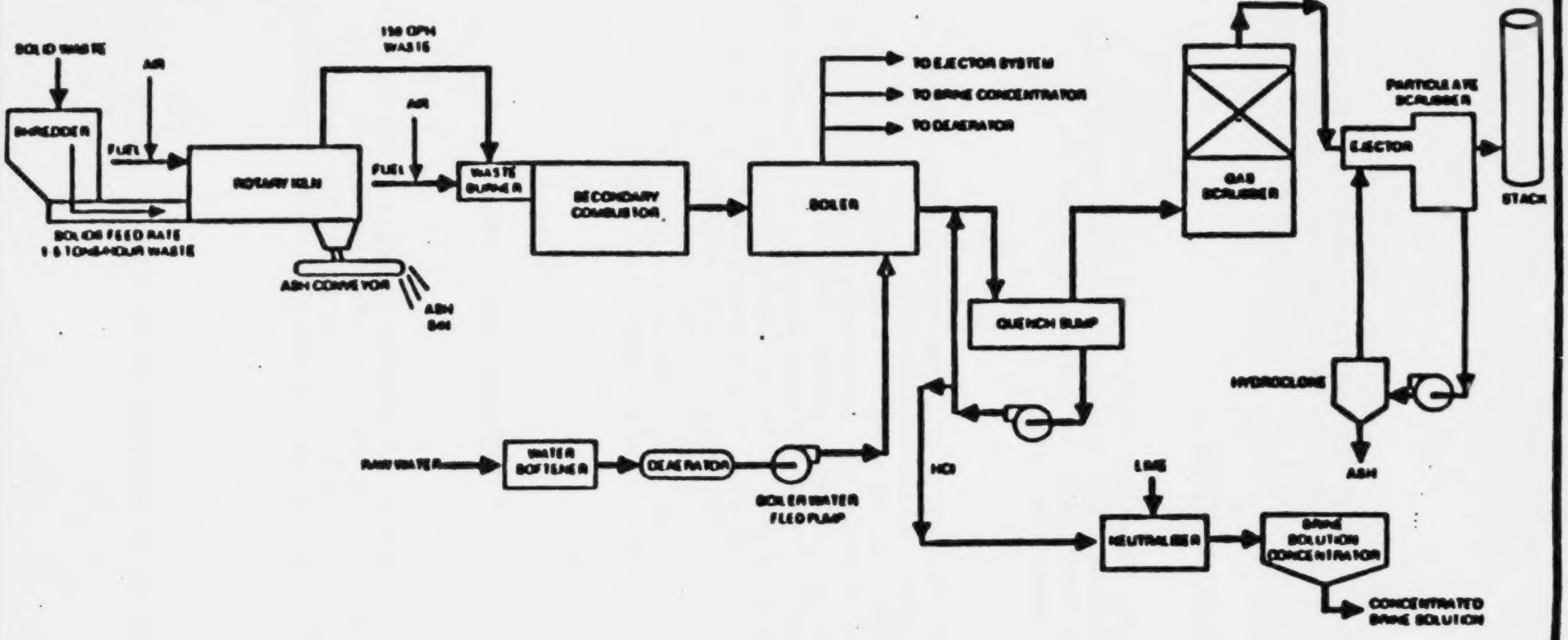
The community requested a list of the responsible parties.

U.S. EPA's Response:

A list of the potentially responsible parties identified and notified by the U.S. EPA is incorporated in the Administrative Record. This administrative record is available both in the repository located in the U.S. Deerfield Post Office and the regional offices in Chicago, Illinois.

F. Concerns About Wildlife
Comment:

A resident asked if wildlife is affected by the Summit National Site.


SOLID WASTE
SHREDDER
AIR
FUEL
ROTARY KILN
SOLIDS FEED RATE
1.5 TONS/HOUR WASTE
ASH CONVEYOR
ASH BIN
150 GPH
WASTE
AIR
FUEL
WASTE BURNER
SECONDARY COMBUSTOR
BOILER
TO EJECTOR SYSTEM
TO BRINE CONCENTRATOR
TO DEAERATOR
RAW WATER
WATER SOFTENER
DEAERATOR
BOILER WATER FEED PUMP
QUENCH SUMP
HCl
GAS SCRUBBER
PARTICULATE SCRUBBER
EJECTOR
STACK
HYDROCLONE
ASH
LIME
NEUTRALIZER
BRINE SOLUTION CONCENTRATOR
CONCENTRATED BRINE SOLUTION

SOURCE: ENSCO ENVIRONMENTAL SERVICES

PROCESS FLOW DIAGRAM OF A MOBILE ROTARY KILN INCINERATION SYSTEM

FIGURE 1

U.S. EPA's Response:

During the course of the Remedial Investigation, there was no wildlife observed at the Summit National Site. The site area is fenced and therefore limits access to animals. In addition, no aquatic life was observed in the on-site ponds or nearby ditches.

G. Past Mining Activities
Comment:

One resident asked how far the Old Strip Mine extended.

U.S.EPA's Response:

The area of Portage County surrounding the Summit National site, has been strip mined extensively in the past. The strip mine pits in the immediate area of the site are located on the southern half of the site as well as two identified areas south of the site where the closed landfill is now located. The approximate locations of the former strip mine pits covered by the landfill are shown on Figure 4-34 of the RI report.

H. Surface Water Concerns
Comment:

A citizen suggested a different route to trap surface water from going to the Berlin Reservoir.

U.S. EPA's Response:

The proposed discharge point for treated water will comply with the technical requirements of NPDES and is approximately 3,000 feet southeast of the site. Though this discharge is in the watershed where the Berlin Reservoir lies, the amount and quality of the discharge water will not impact the Berlin Reservoir.

I. Inorganic Contamination
Comment:

One resident asked what inorganic compounds were detected at the Summit National Site.

U.S. EPA's Response:

The inorganic contaminants detected in each media are presented in the Remedial Investigation Report Volumes I and II. A summary of the major inorganic contaminants in each media is presented in Attachment 3 of this document.

II. Ohio Environmental Protection Agency Comments

U.S. EPA received comments from the Ohio Environmental Protection Agency on March 15, 1988. U.S. EPA has taken the State's comments and organized them into four main subject categories to facilitate response and account for any repetition of comments. The categories are as follows: A. Public Health Evaluation B. Soils and Sediments C. Remedial Action and D. Selected Alternative.

A. Public Health Evaluation

Indicator Chemical Selection:

The commenter suggests that the methodology used to select indicator chemicals deviates from the Superfund Public Health Evaluation Manual.

U.S. EPA's Response:

The methodology used to select indicator chemicals generally follows the guidance in the Superfund Public Health Evaluation Manual (EPA 1986) and the Endangerment Assessment Handbook (PRC, 1985). The Superfund Public Health Evaluation manual provides guidance in developing a Public Health Evaluation at Superfund sites. Citing the manual's preface, it is designed to be flexible allowing the use of professional judgement. The manual provides a range of procedures that may be applicable at any particular site. The procedure employed, which selected chemicals of concern for each medium being evaluated rather than one master list, allowed for evaluation of the greatest potential risk associated with any particular exposure pathway involving that medium. This approach is most useful at sites such as Summit National where a very large number of chemicals have been detected in different media at different concentrations and occurrence frequency. The various technologies that make up a remedial alternative will be screened and selected to remediate contamination on a media-specific basis. A multi-media list of indicator chemicals would indicate that chemical compounds detected in all media occurred in similar concentrations, frequency, and representativeness. This is not the case at the Summit National Site. For instance, PCBs were detected in soils and chosen as an indicator. Since PCBs were not detected in groundwater, using this parameter as an indicator chemical in groundwater would be of no use.

Qualitative Risks:

The commenter suggests qualitative statements of risk should be made for those scenarios that can not be evaluated quantitatively.

U.S. EPA's Response:

Quantitative risks for groundwater are presented in the RI/FS based on future use assuming no action and the concentrations remain as they are now. The selected alternative provides a groundwater treatment technology that eliminates these risks. Therefore, no additional qualitative risk calculations for groundwater would be necessary. Chemicals of concern in groundwater may present a risk to residents in the future if they migrate to residential wells. As a worst case, it could be assumed that the concentrations of indicator chemicals being measured in monitoring wells are future concentrations in residential wells. However, because the private wells are mostly open boreholes in bedrock, chemicals from the water-table and intermediate unit could potentially mix with water from the deeper aquifers at these locations.

There are several exposure routes that could be considered complete and could produce significant risk if the spread of contamination is not adequately contained by the remedial actions. Since concentrations of contaminants are low for quantitative risk assessments for contaminants that might migrate along these routes, qualitative statements of risk are included below to help identify the potential areas where future risk could increase in a no action scenario.

There is a possible subsurface hydraulic connection for contaminated surface water to move southeast along the old stream course from the first impoundment to the second impoundment below the Jones (Manfredi) landfill. If significant release of contaminants were to occur, those waters could carry contaminants from the site into the Berlin Reservoir via a surface water connection from the second impoundment. It is likely that dilution in the reservoir basin would reduce the threat of siginificant exposure for cities using that water supply. However, this route is a potential risk to the populations of the cities and counties that rely on the waters of Berlin Reservoir for a drinking water supply.

Since some of the soils on the site are known to be highly contaminated, an exposure route exists through the movement of fugitive dusts from the site. Dust movement would be particularly significant during any construction activity as was noted in the RI. It is also possible that significant dust movement can and does occur during high wind conditions. The vegetative cover on the site is poor and large areas of the site are bare. If the site is left uncapped, local residents could be at some risk from exposure to dusts blown past the site boundaries. Because construction is not a long term activity, potential exposure to fugitive dust would occur only over a short time period. This occurrence will be monitored closely and the necessary precautions will be taken during the implementation of the Remedial Action.

Currently, the area of contamination in the groundwater appears to be localized in the upper aquifers almost entirely beneath the site. If contaminants are liberated from remaining contamination in soils or if drums of waste are not removed from the site, there is a potential risk to groundwater resources that might become contaminated. Since the groundwater hydrology beneath the site is not entirely defined, it is possible that pathways exist for contaminant movement into drinking water wells. Many of the area wells are open boreholes in rock so it is possible that residential wells could act as a conduit for contaminant migration to the deeper aquifer. Past mining activities at the site may also have left conditions that could allow future migration of contaminants to deeper strata. If conditions at the site are not adequately remedied, it is possible that residents outside of the site boundary could be exposed to site related contamination through future leaching and movement of contaminants in groundwater.

Qualitative risk assessments for surface water in the second impoundment and the Berlin Reservoir were considered but not performed since no direct surface hydraulic connection was able to be made between the site and these two surface water bodies. As stated in the RI, contaminants from the site that may discharge into the Berlin Reservoir via groundwater are further diluted by surface water in the reservoir prior to a water supply intake, to concentrations that are well below achievable detection limits. Therefore, the Summit National site would have no impact on public health from use of water obtained from the current water supply intake from the Berlin Reservoir. It was concluded that contamination in the second impoundment is potentially more affected by the landfill operation and the adjacent spoil piles than by the site.

B. Soil and Sediments

Definition of "Hot Spot" Soils:

The commenter suggests that the areas subject to soil treatment have not been defined adequately.

U.S. EPA's Response:

The "hot spot" scenario was based on achieving an acceptable level of protection by reducing the residual risk associated with the site of 2 X 10^{-4} to 3 X 10^{-5}. The selection of soil block units represented a balance between protectiveness, cost effectiveness, and implementability. The rationale for selection was set at cells exceeding the upperbound cancer risks of 1 X 10^{-5}. The initial 27,000 c.y. represented an economic cost removal scenario with a residual risk of 3 X 10^{-5}. After reviewing the soil blocks units, further consideration has been given to those isolated soil block units that exceed 1 X 10^{-5}. As a result, a new "hot spot" scenario has been developed reducing the residual risk to 2 X 10^{-5}. The total volume of "hot spot" soils is 32,000 c.y. which includes approximately 3,000 c.y. of off site soils along the eastern and southern perimeter.

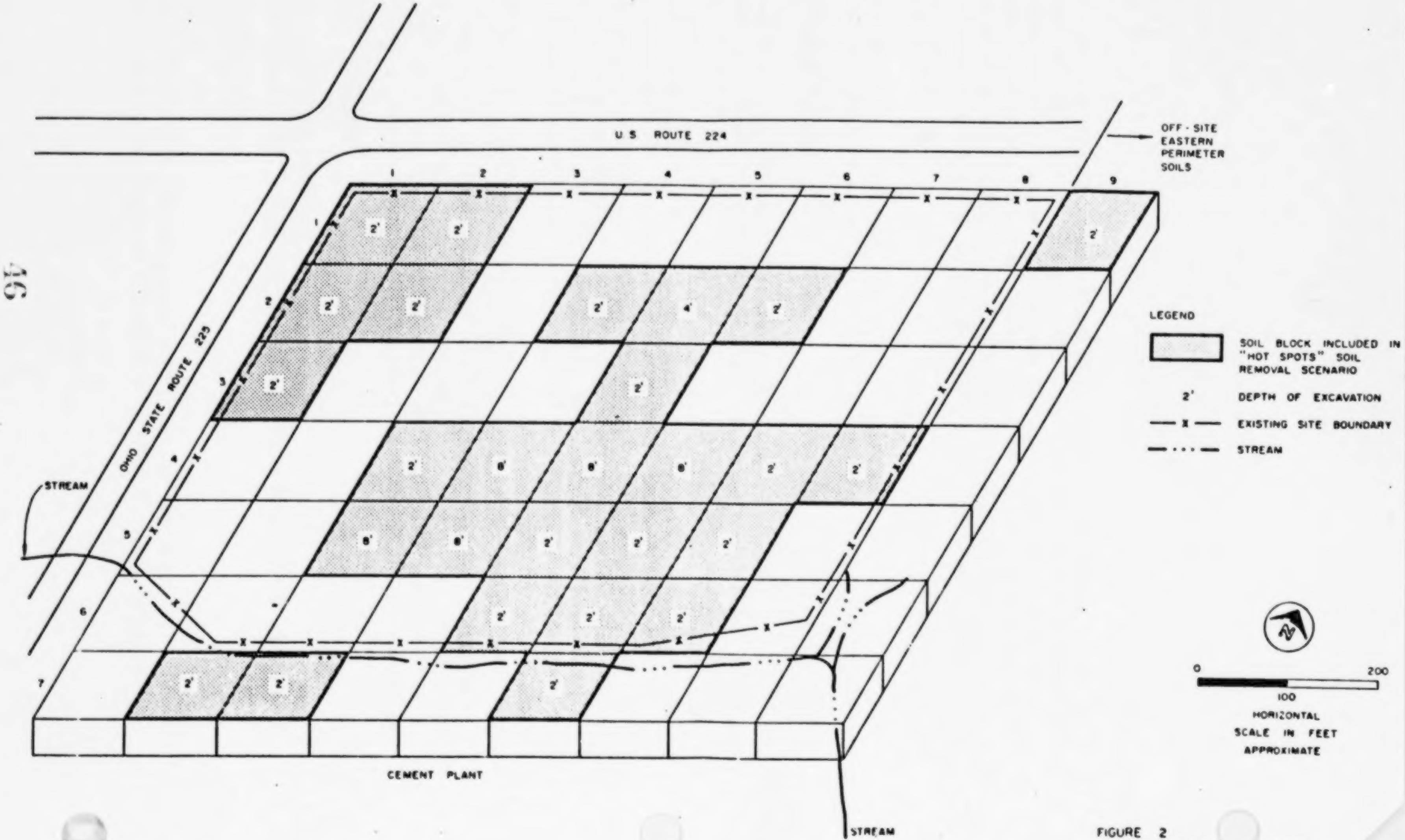

U.S. ROUTE 224
OHIO STATE ROUTE 225
OFF - SITE EASTERN PERIMETER SOILS
1
2
3
4
5
6
7
8
9
STREAM
CEMENT PLANT
2'
4'
6'
LEGEND
SOIL BLOCK INCLUDED IN "HOT SPOTS" SOIL REMOVAL SCENARIO
2' DEPTH OF EXCAVATION
— X — EXISTING SITE BOUNDARY
—· · ·— STREAM
N
0
100
200
HORIZONTAL SCALE IN FEET APPROXIMATE

FIGURE 2
DELINEATION OF "HOT SPOTS"
SOILS REMOVAL SCENARIO

This soil removal scenario is depicted in Figure 2. The additional costs associated with incinerating, and handling the soils is $1,000,000.

Soil Leachability:

The commenter suggests that a more protective alternative be developed based on potential leaching of soils units.

U.S. EPA's Response:

Alternative 7 Incineration of All Unconsolidated Material as presented in the FS, is a more complex alternative but not necessarily a more protective alternative. This alternative would eliminate all leaching of soil and could be considered as a clean closure option. However, this level of action does not necessarily provide additional environmental benefits or protectiveness.

The selected remedial alternative includes a controlled system consisting of a multi-layer cap, slurry wall, and groundwater pumping to achieve gradient control. These components will minimize water passing through the residual contaminated soil blocks, therefore minimizing leaching. The commenters specific statements concerning leaching of antimony to groundwater were not accurate. The RI states that antimony is mobile once in groundwater because of its solubility. It also states that sorption to clays and metal oxides is the most important mechanism for removing antimony from natural waste. This characteristic would seem not to favor leaching.

Soil Clean-up Levels:

The commenter questions how the evaluation of soil blocks are related to clean-up target levels for soils and sediments.

U.S. EPA's Response:

As explained in Appendix A of the RI (page A-1), the cancer risks associated with soil blocks were estimated by comparing the concentrations of the indicator chemicals present in a soil block to those representing a range of lifetime upperbound cancer risks, as indicated in Table 3-2 of the FS. A cancer risk was then extrapolated for the concentration present in the soil block. The cancer risks for each individual indicator chemical were then summed arithmetically to develop a total upperbound lifetime cancer risk for the soil block being analyzed. An example calculation for cell block 4-5 at 0-2 ft. follows:

Indicator Chemical	Concentration	Extrapolated Risk From Table 3-2
Bis(2-ethylhexyl)phthalate	81,000	1.1×10^{-7}
1,2-Dichloroethane	4,300	8.0×10^{-7}
Hexachlorobenzene	0	0
PCB	590,000	5.4×10^{-3}
PAH	0	0
Trichloroethene	86,000	1.9×10^{-6}
	Total Risk =	5.4×10^{-3}

The cleanup levels presented in Table 3-2 are based on a 10^{-6} cancer risk for each chemical presented. Therefore, this table provides general guidance in selecting cleanup goals. Because all of the carcinogenic chemicals included in this table were not found in all samples from all locations, or detected at concentrations that exceed a 10^{-6} risk level, it is inappropriate to simply divide the concentrations listed by the total number of carcinogenic chemicals listed to determine clean-up concentrations that correspond to a total risk of 10^{-6}.

C. Remedial Action
Slurry Wall:

The commenter questions how soils during the construction of the slurry wall will be handled.

U.S. EPA's Response:

The slurry wall will be constructed outside of the limits of contaminated soils and groundwater plume. Therefore, no contaminated soils will be handled during its construction.

Stockpiling:

The commenter sites a RCRA waste pile requirement due to stockpiling of wastes.

U.S. EPA's Response:

The stockpile is a short term staging area, (i.e. less than 90 days), where the contaminated soils will be stored prior to them being incinerated.

A temporary synthetic membrane will be placed underneath the staging area to contain drainage from contaminated materials. This would comply with RCRA waste pile requirements.

RCRA Landfill:

The commenter sites a RCRA landfill requirements or 5 ft. separation between the water table and bottom of the landfill.

U.S. EPA's Response:

The capping of contaminated materials and continual pumping of the water table to stabilize the downward vertical gradient will provide enough separation between the RCRA landfill and the water table to meet the 5 ft. requirement for citing a landfill. Additional hydrogeological characterization to adequately control groundwater movement and remove contaminated water from the intermediate zone will be conducted for the final design of the landfill and groundwater extraction system.

Reliability

The commenter suggests that reliability for the liner was incorrectly evaluated as an extremely positive benefit (++).

U.S. EPA's Response:

The criteria of reliability assessed on Figure 6-1 of the FS report, applies to the overall alternative. The notation of "++" on Figure 6-1 for Alternatives 5 through 9 is based on the addition of reliable treatment technologies to each alternative. Considering the RCRA landfill alone, the notation for reliability would be "+" as shown for Alternative 4.

Sediments

The commenter questions how sediments will be handled.

U.S. EPA's Response:

In Alternatives 8 and 9, as well as Alternatives 5 through 7, contaminated sediments will be excavated and treated on-site. Approximately 1500 c.y. of off-site sediment will be treated along with the on-site soils.

The RI/FS has addressed sediment contamination associated with the Summit National Site. Significant movement of surface water off-site had occurred prior to the RI sampling and also was occurring during the RI field activities. The samples collected during the RI were indicative of any off-site transport of contaminants via surface water. In addition, the emergency action performed shortly after the RI sampling (March 1987), corrected the uncontrolled overflow problem from the eastern pond and regraded portions of the site to prevent runon/runoff. Overflow from the east pond is now controlled through discharge pipes that direct the discharge to the first impoundment.

Double Synthetic Liner:

The commenter believes that the construction of extraction wells and a liner will not provide for a sound integratable structure, considering the large number of wells to be utilized.

U.S. EPA's Response:

The installation of a double synthetic liner and leachate extraction system around the pre-installed groundwater extraction wells does not impact the integrity of the liner. Gundle Lining Construction Corporation and Schlegel, two of the largest liner contractors, have provided construction details that illustrate adequate seals at a point where extraction wells and liners meet (see attached Figures 3, 4,and 5.). This type of liner has been constructed and proven to be a reliable technology in various construction applications. The design effort will try to minimize the number of wells used while maintaining the effectiveness of the groudwater treatment system, based on the additional hydrogeologic characterization, as noted previously.

Groundwater Extraction:

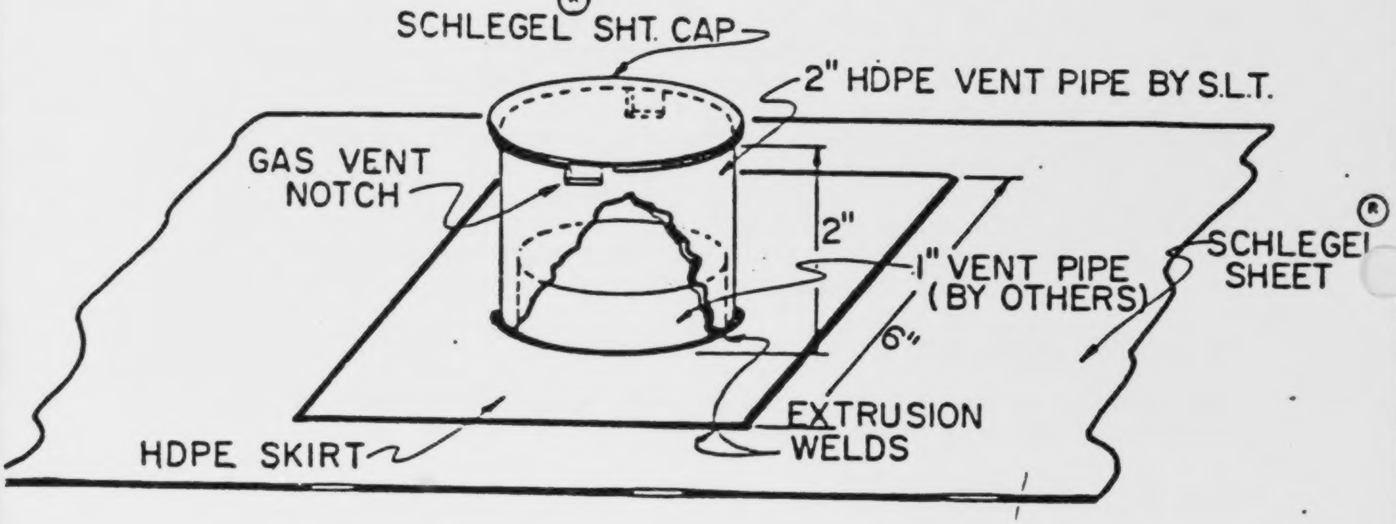
The commenter suggests that an indepth analysis of the effects of groundwater extraction be performed.

U.S. EPA's Response:

Further hydrogeological characterization, as noted previously will be required to finalize the design of the groundwater extraction system. This data will be obtained during the remedial design phase. The 220 wells proposed across the whole site are based on the current hydrogeological information. Due to the poor yield of groundwater and lack of pump test results, additional hydrogeological data need to be obtained in the pre-design or design phase. The number, location, and spacing of wells is not to be interpreted as the final estimate, but rather a preliminary estimate. The design will focus on a minimum number of wells through the liner that will effectively extract the contaminated groundwater plume and provide for a sound integratable structure.

Well Closures:

The commenter recommends closing the tipple and Watson's wells.

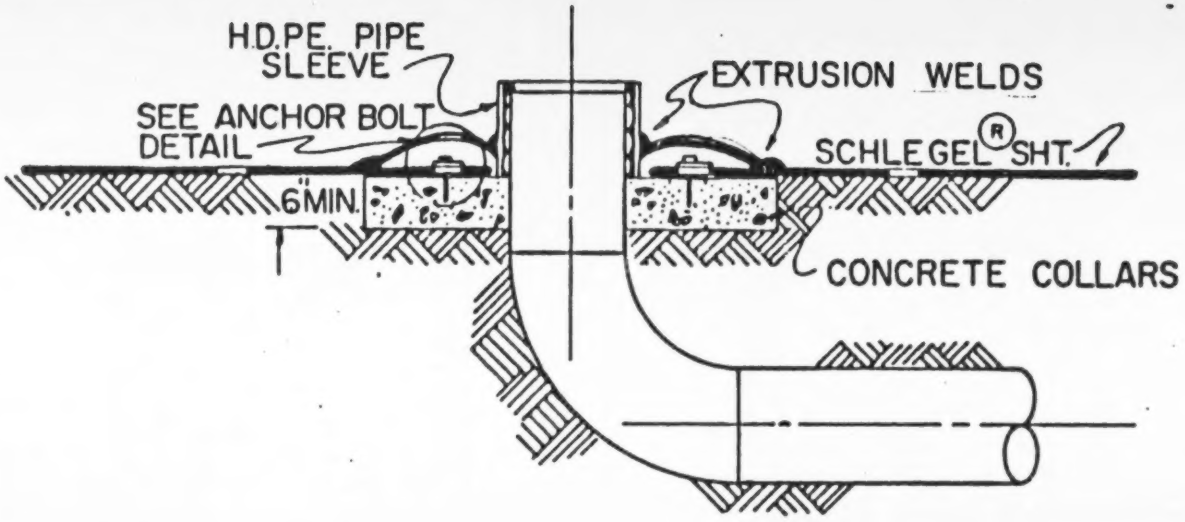

SCHLEGEL® SHT. CAP
2" HDPE VENT PIPE BY S.L.T.
GAS VENT NOTCH
2"
1" VENT PIPE (BY OTHERS)
SCHLEGEL® SHEET
6"
EXTRUSION WELDS
HDPE SKIRT

GAS VENT DETAIL

N.T.S.

FIGURE 3

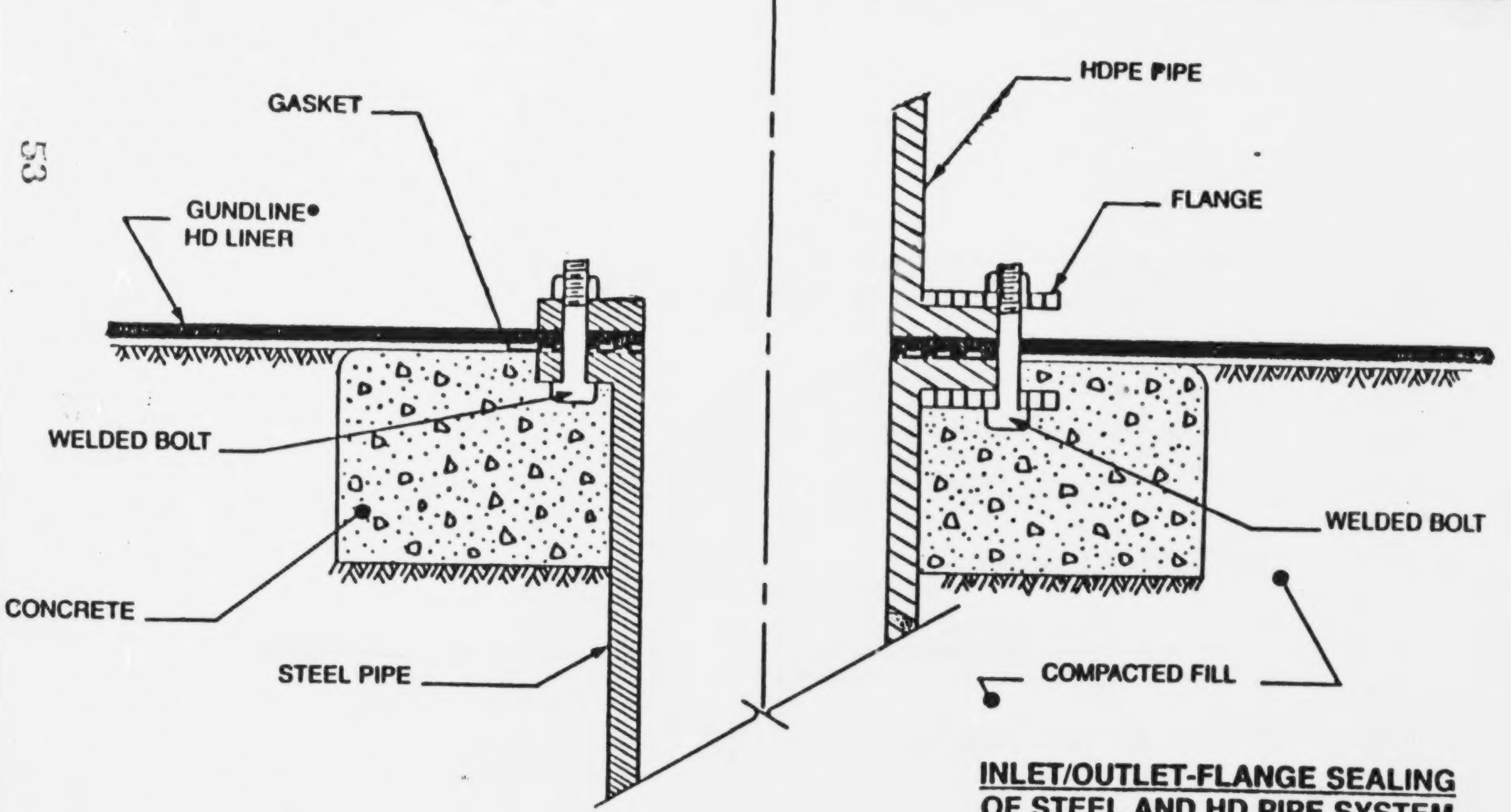
Schlegel®


H.D.PE. PIPE SLEEVE
SEE ANCHOR BOLT DETAIL
6" MIN.
EXTRUSION WELDS
SCHLEGEL® SHT.
CONCRETE COLLARS

BOTTOM PENETRATION DETAIL

N.T.S.

FIGURE 4


GASKET
GUNDLINE®
HD LINER
WELDED BOLT
CONCRETE
STEEL PIPE
HDPE PIPE
FLANGE
WELDED BOLT
COMPACTED FILL

INLET/OUTLET-FLANGE SEALING OF STEEL AND HD PIPE SYSTEM

NOT TO SCALE

Gundle® Lining Construction Corp 1340 E. RICHEY RD. HOUSTON, TEXAS 77073	DATE: 11-16-84
	DRAWING No. SD04
	APPROVED BY:
TYPICAL DETAIL	

FIGURE 5

WING IS THE PROPERTY OF G LINING CONSTRUCTION CORP AND MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT WRITTEN PERMISSI ORMATION BELIEVED T ECT BUT WHICH IS SUBJECT TO CHANGE WITHOUT NOTICE. THE DETAILS ARE OFFERED AS A GUIDE FOR CONSIDE D ASSIST WITH THEIR DESIGNS. H GUNDLE ASSUMES NO LIABILITY IN CONNECTION WITH THE USE OF THIS INFORMATION

U.S. EPA's Response:

The FS narratives indicate that the tipple well and the Watson's wells should be closed during the Remedial Action. This will be included in the Remedial Design.

Residential Monitoring Program:

The commenter recommends that U.S. EPA conduct a residential well sampling program for local groundwater supplies.

U.S. EPA's Response:

A groundwater monitoring program is included as part of the technologies that address the groundwater operable unit. These monitoring wells include existing and proposed new wells that are located around the perimeter of the site. These wells would detect any groundwater contaminant migration from the site toward residential wells. A residential well sampling effort could be initiated at that time if contamination was detected in the monitoring wells.

Strip Pits and Mine Shafts

The commenter raises the concern of strip pits and mine shafts in the area.

U.S. EPA's Response:

Data collected during Phase I and II field investigations did not detect the presence of any 70 feet deep strip pits or old mine shafts at the site. This information was provided by a local resident recently during the public meeting on February 29, 1988. Due to the potential impact these features could have on implementation of the remedial alternative, the identification of such geological structures should be considered during the Remedial Design data collection phase.

D. Selected Alternative

Retained Alternatives:

The commenter is not satisfied with how Alternatives 5 and 8 are compared.

U.S. EPA's Response:

Section 7.3 of the FS presents a further comparison of Alternatives 5 and 8. These alternatives were retained after comparison of all alternatives presented in Section 7.1. The detailed analysis of all alternatives is provided in Chapter 6 of the FS report. Alternatives 5 and 8 were similar in cost and comparable in terms of protectiveness, attainment of applicable, relevant and appropriate requirements (ARARs), reduction in toxicity, mobility, and volume (TMV), and technical feasibility. Reliability and availability were more variable factors in distinguishing between the two alternatives.

Elimination of In Situ Vitrification (ISV) (Alternatives 8 and 9)

The commenter states that ISV was eliminated based on unavailability and reliability.

U.S. EPA's Response:

Availability was not the sole factor for eliminating Alternatives 8 or 9 from consideration, which included ISV as the primary treatment technology for soils. There was no sole factor for their non-selection. Elimination was based on an evaluation of all criteria to eliminate or select a preferred alternative. The selection of a preferred alternative is based on overall suitability and on proven effectiveness, implementability and cost factors.

An evaluation of reliability between Alternatives 5 and 8 can be performed. ISV has no performance record that shows it is a reliable technology at hazardous waste sites. On the other hand, incineration has a performance record at waste sites which in itself indicates more reliability than ISV as a treatment technology.

On-Site Sediments in the East and West Basin

The commenters states that the FS did not address contaminated on-site sediments in the east and west basins and that removal and treatment must be included in the final remedial action.

U.S. EPA'S Response:

The west basin is included in soil removal area and will result in the removal to a depth of 2 feet. The risk values for the east basin sediments indicate they should be addressed. The volume of sediments will be calculated and included during initial design activities.

III. PRP Comments

Legal Comments

Following are the responses to the legal comments made by the PRPs in their March 21, 1988 submission. The PRP commenters have made a number of comments directed to the legal aspects of the RI/FS public comment process. These comments fall into two general categories: (1) challenges to the "fairness" of the timing of the Summit National public comment period and availability of the administrative record, and (2) challenges to the entire RI/FS process under SARA, as administered by U.S. EPA. Region V believes that both the particular process observed in the Summit National situation and the procedures it follows in allowing public participation under SARA are fully consistent with and protective of the rights of the commenting potentially responsible parties.

A. Comments on Public Participation and the Administrative Record

Comment:

The PRPs claim that the public comment period was too short, and that they were not provided with timely access to the administrative record.

U.S. EPA's Response:

The originally identified PRPs were afforded an opportunity to perform the RI and FS, at a series of meetings held in June and July, 1982. They declined to do so, and U.S. EPA proceeded to undertake the RI studies. U.S. EPA's consistent policy with respect to its RI work has been to share only the final document with the public, along with documentation in the administrative record that shows the information considered or relied on by U.S. EPA. The final RI was not, in fact, available until the date on which it was made public. The conclusion of the RI/FS process was delayed by periods in which funds to continue the work were not available due to lack of appropriations. U.S. EPA is not aware who "led" PRPs to believe the RI was concluded and final in mid-1987 (comments at 12). U.S. EPA did not lead the PRPs to this conclusion. In any event, the PRPs received their statutorily mandated opportunity to review and comment on the RI and FS, including access to the administrative record, with minor exceptions of a very few documents whose contents were reflected in the RI itself.

On page 9, in footnote 1, the PRP commenters raise claims that "30 new PRPs" were identified by U.S. EPA. U.S. EPA believes all identified PRPs and the rest of the public have received notice of U.S. EPA's view of their status and the availability of the RI, FS, and administrative record. U.S. EPA's obligation is to provide notice of the documents' availability and an opportunity to review the documents. As a courtesy, U.S. EPA provided a number of copies of the RI and FS directly to counsel for certain PRPs, with the understanding that said counsel would distribute them further. U.S. EPA believes it has met its obligation under SARA and the NCP.

The public comment period was not, as asserted in the comments, only 23 days. The RI and FS were originally made available on February 12, not February 17, 1988 as the PRPs assert. U.S. EPA also extended the comment period from March 11 to March 21, 1988. U.S. EPA believes the guidelines set forth in the present NCP [40 CFR 300.67(d)] provide adequate comment time in light of the competing interests resolved by the cleanup process outlined in Section 104 of SARA and in the NCP. The PRPs' bare reference to documents that were not included in the Record in no way identifies how these documents were or are somehow essential to U.S. EPA's determination of a remedy or to the PRPs' review of that determination. It is worth noting that while the U.S.

EPA did not deliver the entire administrative record to the public repository required to be established under SARA until February 29, 1988, no PRP, despite publication of the record's intended location there and its clear availability in Chicago (where it was available beginning on February 12, 1988), made any effort to see or refer to the record prior to February 29. U.S. EPA therefore questions whether the record"s date of delivery had any effect upon the rights of the PRPs. U.S. EPA exercised its discretion not to allow the PRPs to comment on the FS during development, which discretion is clearly provided in 40 CFR 300.67(a). In sum, U.S. EPA believes the opportunities afforded the PRPs, to do the RI and FS, and to comment on the U.S. EPA's RI and FS once they declined to undertake them, are fully consistent with both SARA and the NCP.

B. Comments directed to the Administrative Process followed by the U.S. EPA under SARA.

Comment:

The PRP commenters have challenged the entire process followed by the U.S. EPA in conducting the RI/FS, and demand trial-type proceedings in remedy selection, including cross examination of U.S. EPA employees and contractors.

U.S. EPA's Response:

The PRPs in their comments seek to challenge the entire U.S. EPA statutory and regulatory process of determining remedial actions at Superfund sites. Congress has established the general framework for that process, which is fleshed out by the regulations incorporated into the NCP. The NCP was duly promulgated as a regulation and the time for challenge has long since passed. The PRPs cite a number of cases in support of their view that the process is constitutionally flawed. U.S. EPA respectfully but completely disagrees with the PRP view on the constitutional adequacy of SARA's remedial selection process. Analysis of a claim of deprivation due process requires determining what process, in the context of the particular claim of deprivation, is due. The RI/FS process is intended by Congress to determine the remedies to be employed to deal with releases or threats of releases of hazardous substances from facilities like Summit National. It is not an adjudication of rights or liabilities of any person, nor does it result in the denial or deprivation of those rights. The processes of determining any liability for payment of cleanup costs incurred by U.S. EPA, or performance of injunctively defined remedial work, are set out in Sections 107 and 106 of SARA, 42 U.S.C. 9607 and 9606. Remedial decisions are more akin to notice and comment rulemaking. This form of administrative process is simply not subject, in most cases, to trial-type proceedings of the sort demanded by the commenting PRPs.

The PRPs cite U.S. v. Hardage, 663 F.Supp. 1280 (W.D. Okla. 1987) as requiring PRP involvement, trial type proceedings and the establishment of a "neutral decision-maker," to provide minimal due process. U.S. EPA disagrees with the PRP reading of Hardage, which was a pre-SARA action under Section 106 of CERCLA seeking an injunction requiring PRPs to perform a cleanup. Hardage holds only that when EPA seeks injunctive relief, it subjects itself to the equitable powers of the court, which allows the court, despite the SARA scope-of-review provisions in 113(j), to make a de novo determination of the applicable remedy.

No 106 relief has been sought here, nor has U.S. EPA sought access to the courts in connection with this facility. Courts generally have recognized, and Congress has determined, that no pre-enforcement review of U.S. EPA remedial decisions is available. The PRPs have been given notice of U.S. EPA's process and an opportunity to comment.

That is all the process due for this stage of the proceedings. The PRPs are given an opportunity to challenge U.S. EPA's decision at the stage where U.S. EPA undertakes enforcement action. The PRP comments will be evaluated and responded to in the course of developing the Record of Decision for this facility.

> U.S. EPA believes it appropriate to direct the PRP's attention to U.S. v. Rohm & Haas Co., Inc., 669 F.Sup. 672 (D.N.J. 1987). The Court distinguished and disagreed with Hardage, and made the following observations:
>
> While we agree that defendants must be afforded some kind of a hearing prior to the assessment of costs against them, we do not believe that they are constitutionally entitled to the full, trial-type hearing that they seek. The flaw in defendants' argument is that it assumes that due process requires a complete adjudicatory hearing, with cross-examination, on the issue of the propriety of the response action. SARA itself contemplates a limited paper hearing before the Agency, prescribing that "[t]he development of an administrative record and the selection of response action under this Act shall not include an adjudicatory hearing." 113(k)(2)(C) of SARA, 42 U.S.C. 9613(k)(2)(C). Moreover, in Lone Pine Steering Committee v. EPA, 777 F.2d 882 (3d Cir. 1982), cert. denied, ... the Third Circuit suggested that due process would be satisfied with a limited agency hearing. The Third Circuit rejected the plaintiffs' argument that due process required pre-enforcement review, holding instead that the 107 reimbursement hearing adequately protected the plaintiffs' rights.....

In determining the process that is constitutionally due in a particular case, a court must balance three factors: (1) the private interest at stake; (2) the risk of erroneous deprivation of that interest through the procedures used and the probable value, if any, of additional safeguards; and (3) the government's interest, including the burdens that additional procedural requirements would entail. Matthews v. Eldridge, 424 U.S. 319, 335 (1976). Applying these principles to the present case, we conclude that the informal hearing envisioned in SARA and implicitly endorsed in the Lone Pine case is sufficient to satisfy the requirements of due process.

First, we recognize the important financial interest that potentially responsible parties have in the selection of a response action, particularly where the liability could amount to millions of dollars. However, there is an overwhelming countervailing public interest, as evinced in CERCLA, in effecting the expeditious clean-up of potentially health and life threatening hazardous waste sites. The imposition of long, drawn-out, and costly trial-type procedures, either at the agency level or in a de novo proceeding in district court, could greatly hinder this effort. Moreover, we are unconvinced that formal trial-type hearings would advance the defendants' interests inaccuracy or equity.

With respect to this final issue, it is important to emphasize the nature of the agency decision-making at issue here. The agency's determination of an appropriate response action involves inspections and testing aimed at discovering the types of waste present at a site and the extent of the hazard, and technical investigations to develop an appropriate solution to the problem. Congress vested a certain amount of discretion in the U.S. EPA in its choice of a response action, requiring only that the costs for which it seeks reimbursement be not inconsistent with the NCP. The ultimate selection of a response action depends upon a balancing, by the agency, of a number of factors, including cost, technology, reliability, and public health, welfare and environmental effects. See 40 C.F.R. 300.68. Thus, the U.S. EPA's decision-making process at

> issue here need not involve a reconstruction of past events through eyewitness testimony and credibility judgments, as would be necessary where, for example, a liability determination was being made. Rather, the process involves the evaluation of numerous expert reports and technical data. As a result, the focus for purposes of due process analysis should be on whether interested parties have an opportunity to participate in the development of such informationand technical data before the agency.
>
> Under these circumstances, where the parties are allowed to comment on the agency's proposals and to submit reports of their own experts, the quality of the initial decision-making process would not be greatly enhanced by the presentation of live testimony or the use of cross-examination.
>
> Moreover, we believe that an administrative record built on such an exchange of opinions and comments by experts and informed citizens and containing an explanation by the agency of its reasons for accepting or rejecting the various proposals, provides an adequate basis for subsequent judicial review. Under such circumstances, the administrative record has not "been created almost entirely by the U.S. EPA....[with] virtually no evidence that might exculpate" the defendants. Rather, it reflects the contemporaneous analyses and criticisms of all interested parties, and therefore provides a comprehensive framework from which the court can scrutinize the agency's action.
>
> For all of these reasons, we conclude that SARA's informal agency hearing procedures, and deferential standard of judicial review satisfy the requirements of due process. *U.S. v. Rohm & Haas Co., Inc.*, id. at 679-81.

This extensive quotation, which includes the language extracted from its context in the PRP's cite at p. 20 of their comments, clearly supports the process U.S. EPA has and will follow here. The PRPs are not entitled to, and will not be given, a trial-type proceeding at this stage in the process. They are provided by SARA with an opportunity to review the RI and FS, and the balance of U.S. EPA's record, and to make comments on the remedy identified by U.S. EPA. They have now availed themselves of that opportunity. Their comments will be considered and responded to by U.S. EPA, and incorporated into the administrative record. Their comments may affect the remedial selection process which culminates in U.S. EPA's Record of Decision. Should the U.S. EPA not be able to negotiate a PRP performed cleanup, post-ROD, the PRPs will be at liberty to raise issues by way of defense and request a review of U.S. EPA's remedial decision in any action brought under Section 106 and 107 of SARA.

Technical Comments:

The following section provides responses to technical issues raised by the PRPs and presented to the U.S. EPA in the Summit National PRP Group Report dated March 11, 1988. Their detailed analysis of the technical issues are presented primarily in Attachment E which is the Conestoga-Rovers Associates (CRA) Report. U.S. EPA's response will be focused on specific technical comments presented in Attachment E in an attempt to avoid for repetition of comments. A comparison of comments presented in the main report was made to insure all issues where addressed in the CRA report.

Attachment E - Conestoga-Rover Associates (CRA) Report Comments and Responses March 1988

The responses to the CRA report are grouped into several categories. The Executive Summary is broken into comments concerning the RI and FS reports and then presents the PRP group's proposed alternative. Each of these sections will be addressed separately. Following responses to the Executive Summary, a comment by comment discussion of issues not already discussed will be performed.

Executive Summary

A. Remedial Investigation:
Comment (i):

The PRPs claim that U.S. EPA did not provide supporting documents and data necessary for a complete and comprehensive review of the RI/FS.

U.S. EPA's Response (i):

All data collected during both phases of the RI is presented in the final RI Report, both in Volumes I and II. These data are again summarized in the FS. All supporting documentation is available in the Administrative Record located at the Deerfield, Ohio Post Office and U.S. EPA's regional office in Chicago. There are no existing data missing that were used in the preparation of the RI or FS reports.

Comment (ii):

The PRPs claim that U.S. EPA did not perform its QA/QC data validation procedures properly.

U.S. EPA's Response (ii):

All analytical data collected during the RI were reviewed in accordance with U.S. EPA quality assurance protocols in place at that time. These guidelines are presented in Appendix B of the RI Report Volume II. The valid data are presented in summary tables in Appendix A of the RI Report Volume II. The QA/QC assessment procedures are discussed in Section 4.1 of the RI Report Volume I. A summary of the analytical problems is presented in Tables 4.2 and 4.3. Based on these problems, the data were either omitted from Summary Tables or proper qualifiers were added. Therefore, following the above guidelines, U.S. EPA has properly identified those contaminants that are not attributable to the Summit National Site.

Comment (iii):

According to the PRPs, improper well locations and depths resulted in misleading hydraulic conductivity data.

U.S. EPA's Response (iii):

The selection and depth of well locations during Phase I of the RI was based on available data at that time. The Phase II monitoring well installation program and groundwater investigation activity were based on data collected from Phase I. This provided more accurate information on the hydrogeological characteristics of the site. A pump test was considered. However, the yield of the wells did not indicate that any reliable data could be obtained due to the low pumping rate of less than 1 gal/min. that could be sustained. Many of the monitoring wells were hand bailed dry while purging prior to sample collection.

Comment (iv):

The PRPs claim that characterization of the intermediate aquifer was performed incorrectly.

U.S. EPA's Response (iv):

Due to the complex geology at the site, the initial separation of geologically similar units based on lithology led to the identification of three primary units for the purpose of the RI analysis. The intermediate unit was later separated into the upper and lower units and a discussion of each was performed.

Comment (v):

The PRPs claim that the data for on-site and off-site soils was biased and contamination levels were over-estimated.

U.S. EPA's Response (v):

Soil samples with the highest concentrations for volatile organic analyzers (VOAs), and base neutral acids (BNAs) screening indicator compounds were selected because the purpose of the RI investigation is to define the nature and extent of contamination. Some uncontaminated samples were sent to the Contract Lab Program (CLP) for analysis to confirm the accuracy of the screening program. The objective of selecting samples for analysis is to choose those that pose a concern and warrant remediation. Uncontaminated samples are not a concern. If the sampling was conducted in the manner proposed by the commenters, the conclusions developed would ignore the existing contamination problem. In addition, the RI sampling program used covers the overall site and provides data to assess average risks as well as area specific risks (See Appendix A of the FS Report).

Comment (vi):

According to the PRPs, the RI has failed to address the presence and source of background soil contamination.

U.S. EPA's Response (vi):

The northern edge of the cement plant was impacted by the Summit National Site during active site operations. This is based on the fact that this portion received direct drainage from the site prior to rerouting the southern ditch and is supported by the analytical data gathered during the RI. The RI addressed the presence of contaminants in background soils. An evaluation of background soil data was performed to determine if certain compounds were site-related, naturally occurring, or from other sources. This assessment of background soils is presented in Section 4.4.3.1 of the RI Report. The presence of contaminants due to other sources is considered, but the positive identification of other sources is not part of the Summit National Site investigation. Other potential sources mentioned in the RI do not indicate that contamination associated with the Summit National Site originated from other sources.

Comment (vii):

The PRPs state that the presentation of on-site soil data is misleading.

U.S. EPA's Response (vii):

The presentation of on-site soil data may have confused the commenters, but it is not misleading. Soil data were presented in Chapter 4 of the RI Report, with the purpose of defining the nature and extent of contamination in soils. Presentation of these data in the form of mass of contaminants was considered but not used. The presentation of data used in Chapter 4 is not for assessment of risk.

Neither is mass of contamination necessarily indicative of health risks. Remediation is based on risk reduction which is based on health risks identified in the Public Health Evaluation (PHE).

Comment (viii):

According to the PRPs, the RI does not address the potential impact to surface water in the southern ditch from off-site contaminants in the cement plant yard.

U.S. EPA's Response (viii):

Surface water flow in these ditches occurs only in response to precipitation or discharge from the east pond. Laboratory results indicate the presence of contamination in surface water. The northern edge of the cement plant property that contributed runoff to the southern ditch was affected by previous site activities as discussed previously. Therefore, the source of the contaminants in the southern ditch can be connected to the site directly or indirectly due to the site's effect on the cement plant soils.

Comment (ix):

The PRPs claim that background sediment samples were not collected during the RI.

U.S. EPA's Response (ix):

The furthest upstream sediments sampling location does not have the highest level of contaminants as the commenter states (see RI Tables 4-45 through 4-47). Background sediment samples were obtained from an upstream location not affected by site activity. In addition, the sediment samples were also compared to background soil samples, since these soils may have acted as a source for background sediment characteristics. Both comparisons indicate site related contamination levels above background soils and sediments for both on-site and downstream sediments.

Comment (x):

The PRPs state that the investigation used to identify the location and quantity of subsurface waste was inadequate.

U.S. EPA's Response (x):

All magnetic anomalies identified during the magnetometer survey were investigated through test pit excavations. These test pit excavations exposed the buried drums and allowed for visual estimates of numbers and orientation of buried drums. In addition to subsurface exploration through test pits, the 32 soil borings across the site did not encounter any buried drums outside the magnetic anomalous areas. A drum investigation through parallel trenches is very extensive and better suited for a remedial design data collection effort.

Comment (xi):

According to the PRPs, the RI fails to determine or estimate the ultimate fate of groundwater contaminants.

U.S. EPA's Response (xi):

A delineation of the groundwater plume in the water table and upper intermediate wells is presented in Figures 4-13 through 4-16, 4-18 and 4-19. The potential for groundwater contaminant migration is presented on Tables 4-9 through 4-11 which predict concentrations at points 100 ft., 1450 ft., and 4500 ft. down-gradient of the site. Based on the above, both the plume and ultimate pale of groundwater contamination has been defined.

Comment (xii):

The PRPs claim that the Public Health Evaluation (PHE) assumes a worst case scenario which leads to a great overstatement of present and future risk.

U.S. EPA's Response (xii):

The PHE does assume the worst case exposure scenario based on the maximum concentration. However, the PHE also evaluates the risk associated with average concentration of contaminants. Both analyses assume the no-action alternative as required by the PHE guidelines.

Comment (xiii):

According to the PRPs, the PHE incorrectly quantifies carcinogenic risk caused by polynuclear chlorinated hydrocarbons (PAHs) on the basis of the total of all PAHs.

U.S. EPA's Response (xiii):

Carcinogenic risks associated with PAHs are based on only those PAHs considered to be carcinogens.

Comment (xiv):

The PRPs claim that risks from background soils are not significantly different and in some cases greater than risks posed by the site.

U.S. EPA's Response (xiv):

The total cancer risk associated with incidental ingestion of background soils over a lifetime exceeds 10^{-6} for a plausible maximum exposure and is equal to 10^{-6} for the average exposure scenario. The future residential scenario for exposure to on-site soils results in average risks of 1×10^{-5} and plausible maximum risk of 5×10^{-3}. Both values are at least one order of magnitude higher for on-site soils than background soils.

B. Feasibility Study:

Comments (i):

The PRPs believe that the extension of the site boundary is unnecessary.

U.S. EPA's Response (i):

The extension of the site boundary is not based solely on soil contamination, but also concerns regarding the off-site extent of groundwater contamination and contaminated off-site sediments. The slurry wall and the relocating of the southern drainage ditch must be constructed beyond the area of contamination. In conclusion, adjacent offsite properties are required for implementation of the remedial action.

Comments (ii):

The PRPs propose that a permeable soil cover should be installed instead of a RCRA cap.

U.S. EPA's Response (ii):

There are no available data to indicate that flushing of the contaminated subsurface soils would lead to their cleanup. Infiltration through the permeable soil cover proposed by the commenters would be counter-productive to the groundwater extraction and gradient control system as outlined in the recommended alternative. In addition, the soil cover does not properly contain hazardous materials from becoming exposed due to freeze and thaw cycles which can cause cracking.

Comment (iii):

The PRPs believe that the FS has erred in its evaluation by considering subsurface soils to be available for human contact and incidental ingestion.

U.S. EPA's Response (iii):

The risk numbers estimated for subsurface soil blocks were used as a mechanism to select soil blocks to be included in the "hot spot" soil removal scenario, and not to define the risk of the site. The risk associated with soils was based on surface soil blocks units. The risks estimated for soil blocks at 2 ft. depth intervals from 2-8 ft.

were not the only criteria used to select "hot spot" soils. Past site activities, disturbed versus undisturbed soils, and handling during excavation were also considered. The delineation of "hot spot" soils represent the most cost effective and practical removal scenario. The risk numbers used in the PHE represent risk presented by the entire site based on surface soils which are available for human contact and incidental ingestion.

Comment (iv):

According to the PRPs, the FS is inconsistent and arbitrary in that the need for surface control is not evaluated on the same basis as the need for soil removal.

U.S. EPA's Response (iv):

Risks greater than 10^{-6} are spread throughout the site, therefore warranting remedial action to protect against exposure to unacceptable risks. Risks greater than 10^{-6} are estimated for about 54% of the cells that range between depths of 0 to 2 ft., and about 48% in cells that range in depths between 6 to 8 ft. If we look at soil cells as columns ranging from 0 to 8 ft., about 30% would exhibit risks greater than 10^{-6} and this is spread throughout the site. Therefore, a surface control across the entire site is needed to provide adequate containment of unacceptable risks associated with soils. Surface controls are not used only to prevent contact with contaminated soils, but also to reduce infiltration. Reduction of infiltration through the surface is an integral part of the groundwater gradient control system. Any part of the site that is not properly covered would allow greater infiltration and be counter-productive to the groundwater treatment system.

Comment (v):

The PRPs believe that the groundwater extraction system proposed by the U.S. EPA is extremely costly, complicated and unreliable.

U.S. EPA's Response (v):

The primary goals of the groundwater extraction system are to provide gradient control to stabilize flow from the water table into the upper intermediate zone and to pump and treat the contaminated upper intermediate unit and water table aquifer. The interceptor drains and wet well system proposed by the PRPs, fail to control migration of the contaminated water table downward, which could continue to contaminate the upper intermediate unit indefinitely. U.S. EPA's proposed alternative could allow for cleanup of the upper intermediate unit within 5 to 10 years.

The commenter has provided no basis for statements regarding cost while U.S. EPA has provided substantial details of cost estimation that are within an acceptable FS range of +50 and -30 percent.

Comment (vi):

According to the PRPs, the FS does not provide an estimate of the chemical quality of the waste stream from extracted groundwater or surface water that will require treatment.

U.S. EPA's Response (vi):

The chemical quality of the extracted groundwater or surface water to be treated does not need to be "estimated" as the commenter suggests. The data obtained and presented in the RI report already provide current chemical characterization of all water to be treated. The proposed groundwater treatment system is based on these results. The current groundwater and surface water quality was evaluated by process design engineers and no current contaminant characteristics presented an unsolvable problem to designing a groundwater treatment system to meet ARARs. A treatability study could be incorporated in the remedial design phase. Once the system proves effective and is in place, monitoring will be conducted to assure its efficiency.

Comment (vii):

The PRPs claim that the FS does not develop nor evaluate a sufficient number of alternatives to rationally evaluate reduction of risk.

U.S. EPA's Response (vii):

In accordance with requirements under the Superfund Amendments and Reauthorization Act (SARA), an FS should develop a range of treatment alternatives which is delineated primarily by the degree to which each alternative relies on long-term management of residuals or untreated waste. A key consideration is the degree to which the alternative reduces toxicity, mobility, and volume (TMV) of contaminants as its principal component. In addition to a range of treatment alternatives, a containment option involving little or no treatment and a no action alternative should also be developed. The FS develops a range of alternatives that begin with no action, monitoring and a range of treatment alternatives starting with partial treatment and full treatment to the maximum extent practicable. This process allows for a thorough analysis of alternatives and is consistent with the NCP and SARA. Alternative 2 represents the minimum action alternative with monitoring only while Alternative 3 represents containment with minimal treatment. Alternative 4 provides a better containment scenario with minimal treatment. Alternatives 5 through 7 provide a full range of treatment alternatives that incrementally go from "hot spot" soils treated to full treatment to the maximum extent possible. Alternatives 8 and 9 provide an additional range of treatment alternatives by considering an additional treatment technology.

Comment (viii):

According to the PRPs, the FS cost estimates are poorly developed and suffer from several major defects.

U.S. EPA's Responses (viii):

All costs are developed using the U.S EPA costing manual to provide a +50 and -30 percent cost estimate. The costing procedures used by U.S. EPA did apply proper contingency factors where appropriate according to established costing guidelines. The total cost for a specific alternative is the sum of the capital cost plus the present worth of all operation and maintenance costs. An important point to note is that the costing methodology is consistent for all alternatives which allow direct comparison of each alternative based solely on cost, regardless of how technically similar or dissimilar the alternatives may be. The project cost estimate becomes more refined as the design progresses from ROD to final design. A more detailed cost analysis taking into account time completion schedules will be done in the remedial design phase when the proper plans and specifications are available.

C. PRP's Preferred Remedial Action Alternative:

This section provides a review and evaluation of the alternatives proposed by the PRP group. It provides a general response rather than a focused response on each specifically proposed element. Of the nine components proposed by the PRPs, seven of them coincide with U.S. EPA's proposed Alternative 5. The two components that are different are still fundamentally the same in regard to remedial actions that are required but different in the choice of technologies.

The groundwater extraction system consisting of an interceptor drain and wet well system and the proposed permeable cover are the two areas that differ. This proposal fails to stop groundwater contamination from migrating downward and does not provide an effective extraction system for contaminated groundwater. The PRP's proposal would require intermediate unit groundwater treatment indefinitely.

The permeable soil cover allows for increased potential of groundwater contamination moving with the upper intermediate zone from the water table zone and does not adequately contain soils with residual contamination on site, thus resulting in inadequate protection from exposure to human receptors and environment. The proposal, however, appears to be fairly well in agreement with U.S. EPA's selected alternative with respect to the remainder of components, as presented in the ROD "Selected Remedy."

SECTION BY SECTION RESPONSE TO CRA REPORT

Only comments that were not specifically addressed in the Executive Summary Response will be considered in the following response section. Section 2.0 of the CRA report addresses the RI report and comments were grouped into general topical categories or concerns for each subsection and responded to accordingly.

SECTION 2.1 - GENERAL

Comment:

The PRPs claim that certain documents were not available to them.

U.S. EPA's Response:

All the documents referenced by the PRPs were available in the Administrative Record located in the repository at the Deerfield U. S. Post Office or at our regional office in Chicago. The Remedial Action Master Plan (RAMP) is not a document that was used to assess site conditions or evaluate alternatives in the FS process. Items i) through ix) were developed to address site-specific conditions and objectives. This is thoroughly discussed in the RI report. Work plans and Quality Assurance and Project Plans (QAPPs) provide more detailed information regarding the scope of work to be performed and the methodology. These documents were final and available for review. Phase I Work Plan and QAPP were finalized 7/27/84 and 5/29/84, respectively. Phase II Work Plan and QAPP were finalized 11/5/85 and 10/24/85, respectively. These documents could have been requested any time after they were finalized.

Comment:

According to the PRPs, the soil screening procedures were inadequate.

U.S. EPA's Response:

The Phase II screening procedure was designed to eliminate the need for sending all samples to CLP analysis, thus resulting in significant cost savings. After the screening of all the on-site soil samples was complete, a plot of the results was evaluated so that the appropriate samples could be sent to the CLP laboratories. The selection of samples for CLP analysis was based on the following criteria:

a. The concentration of contaminant levels;

b. The number of contaminants identified in a particular sample or group of samples;

c. The location of the sample on the site;

d. The depth of the sample from the surface; and

e. The proximity of the sample to a buried drum or visually contaminated area.

Several "clean" samples were selected for CLP analysis to verify the accuracy of the screening program. Phase I sampling included a composite of five sample portions per 100 sq. ft. across the whole site for a total of 49 surface soil samples. Phase II collected 319 samples out of which 52 on-site samples, 19 background samples, and 25 off-site samples were sent for Hazardous Substance List (HSL) analysis. These sample locations are representative of the whole site, as demonstrated in the RI Report Figures 3-9 and 3-10. These maps clearly show that the sampling program, including screening, are not biased, but representative of the whole site.

Comment:

According to the PRPs, the soil sample selection was inadequate.

U.S. EPA's Response:

The regrading of the site is discussed in Section 1.2.3 of the RI report. The site surface regrading was done in conjunction with the surface cleanup performed by the U.S. EPA in 1981-1982. The surface cleanup included only incidental contaminated soil removal. Regrading was performed to control site runon/runoff. This information was known during the development of the sampling plans. As a result, the Phase I surface soil sampling program was designed to characterize the surface soils remaining on site since little contaminated soil was removed. It is U.S. EPA's opinion that the minor soil removal and regrading efforts did not redistribute surface soils enough that composite samples from the 100 ft^2 blocks would not be representative of undisturbed soils. The Phase II sampling program was developed to determine the vertical extent of contamination below contaminated surface soils identified as Phase I.

Comment:

The PRPs claim that the background comparison was inadequate.

U.S. EPA's Response:

The selection of background samples used for comparison to on-site soils provided a cross section of soil types in the local area. These included agricultural, residential and mine spoil. The average background data, therefore, took into account any possible contribution to chemical characteristics of local soils due to naturally occurring materials. A comparison was also made to residential soils alone which resulted in similar conclusions. In both analyses the site did show contaminant levels several orders of magnitude above background, thereby not warranting further separate soil type comparison (see page 4-75 of the RI Report). In regard to inorganics, an additional comparison was made to confirm inorganic contamination present on site. Levels were compared to U.S. typical concentrations which indicated that 11 out of 20 inorganics exceeded background. An on-site soil was determined to be contaminated if its mean and maximum values exceeded the upper 95% confidence limit for background soils. If the mean concentration did not exceed the upper 95% confidence limit, but the maximum did, then an evaluation was made based on frequency. Based on previous discussions, the PHE is representative of site contaminants and is not typical of background conditions.

SECTION 2.2 - ANALYTICAL DATA

Comment:

The PRPs state that the analytical data were reviewed improperly.

U.S. EPA's Response:

All the data obtained during the RI underwent Quality Assurance and Quality Control (QA/QC) assessment according to procedures provided in Appendix B of Volume 2 of the RI Report. These procedures were the accepted protocol at that time. The data were reviewed by U.S. EPA Region V staff and appropriate qualifiers or invalidation was noted. Tables 4-2 and 4-3 of the RI summarize data problems identified. In addition to U.S. EPA review, the data were also assessed for Contract Lab Program (CLP), and Central Regional Lab (CRL) data completion by ICF/SRW and CH2M Hill staff. These quality assurance objectives and QA/QC assessments were detailed in the approved Phase II QAPP dated October 24, 1986 prior to initiating field activities.

Comment:

The PRPs claim that the data were qualified inadequately.

U.S. EPA's Response:

Data results attributable to laboratory contamination are represented in Section 4 of the RI Report. Parameters such as methylene chloride, acetone, and toluene with concentrations less than 10 times the concentration detected in the blank are qualified as lab contaminants, by both the CLP and the U.S. EPA QA/QC office. The valid data are presented in summary tables in the RI Volume II and are designated with the letter "B". Data analysis performed in Section 4 of the RI report distinguishes those parameters attributable to laboratory contamination and eliminates them as site-related contamination.

Those concentration levels reported within brackets are qualified as concentrations below the laboratory detection limits, which is not considered a positive hit. Those parameters qualified with a "J" are an estimated value. If "J" is accompanied by brackets, it is an estimated concentration below the contract laboratory detection limit.

SECTION 2.3 - HYDROGEOLOGICAL CONCERNS

Comment:

According to the PRPs, improper methods were used to define hydrogeological properties.

U.S. EPA's Response:

As discussed previously, we agree that additional hydrogeological characterization is necessary. It was necessary to screen monitoring wells across multiple strata for two reasons: 1) many of the strata encountered were too thin to be isolated during well construction and, 2) the strata were, for the most part, very fine grained and relatively unfractured, so it was necessary to install long gravel packs to assure that the wells would yield sufficient water for sampling. The cross sections and boring logs are very detailed, so that many of the strata identified are very similar to the units immediately adjacent. Care was taken to avoid installing monitoring zones across strata which appeared, on the basis of lithology or fracture density, to be hydraulically dissimilar. Furthermore, if the monitored zones crossed strata of dissimilar permeabilities, the hydraulic conductivities measured would not be "atypical", but would rather be values most similar to the most conductive unit intercepted. The commenter does not appear to believe the hydraulic conductivities obtained for sandstone and coal. The sandstone was fine-grained, silty, and well cemented. U.S. EPA believes that field data should not be disregarded just because it does not fit a perceived or textbook notion.

Comment:

The PRPs believe that there is a need to define regional hydrogeology.

U.S. EPA's Response:

Regional hydraulic information is not needed to remediate a site. Monitoring well MW-8 was omitted initially because of the change in stratigraphy between it and the remainder of the site as shown on the cross section provided in both the RI and FS reports.

Comment:

The PRPs believe that hydraulic conductivities are uncertain.

U.S. EPA's Response:

The commenter is uncertain of the hydraulic conductivities because normally a pump test is performed. Pump tests are not feasible in low permeability strata. They were considered during Phase II field activities but due to low yield of most wells (less than 1 gpm) and the ability of the wells to be bailed dry during purging they were not performed.

Comment:

The PRPs do not agree with U.S. EPA's well instrumentation employed during the remedial investigation.

U.S. EPA's Response:

The use of PVC material for well construction seems to be a favorite topic of discussion. The specifications for well construction were approved for both the Phase I and Phase II well installation activities. All recent studies have indicated that PVC is a reasonable well material, provided the well is purged before sampling. All wells at the Summit National Site were purged prior to sampling.

Comment:

The PRPs disagree with U.S. EPA's interpretation of groundwater conditions.

U.S. EPA's Response:

There are two aquifers identified at the site plus a series of intermediate units, not three aquifers as the commenter states. The intermediate units do not constitute aquifers. The calculations using Darcy's law to quantify groundwater flow were order-of-magnitude estimates only; they were never intended to be quantitative. It seems that the commenter is looking for conclusions beyond the scope of the RI report. The RI did not present water balance calculations as they suggest. Again, it was clearly indicated that all flow calculations were order-of-magnitude estimates.

Comment:

The PRPs have an alternative assessment of the flow system.

U.S. EPA's Response:

The commenter does not indicate the reason for believing that the intermediate units constitute multiple hydrogeologic units. Although the limestones indicated extremely low permeabilities, the remainder of the strata in that zone also have low permeabilities. No high-permeability strata were encountered, so there is no reason to divide the series of low-permeability strata into multiple aquitards with no intervening aquifers. The RI acknowledges that the intermediate units constitute a highly heterogeneous aquitard, and as a result U.S EPA does not believe that interpretation of the site is enhanced by further dissection of this series of strata.

The commenter's suggestion that the limestone is relatively continuous and tight and thereby prevents interference between the two intermediate zones is incorrect. The hydraulic test simply suggests that we measured a very low permeability in one well. Given the return of single well test, it is not prudent to evaluate the entire site interpretation on a single value.

The commenter's inclusion of the limestone unit into a subsurface hydrogeologic water balance appears to constitute an over interpretation of the data. The possibility that dense non-aqueous phase liquid (DNAPL) could migrate vertically downward against the groundwater flow that is up-gradient in the area of MW-22 and MW-23 does not alter any conclusions.

SECTION 2.4 - CONTAMINANT DISTRIBUTION

Soils Sampling Program:

These comments were similar to the general comments in Section 2.1. The soil sampling program was developed to provide data on the horizontal and vertical extent of soil contamination at the Summit National Site. An important consideration in developing a representative sampling plan is the implementation of a potential remedial alternative. The 48 square blocks established by the site grid and a sampling plan for evaluating four consecutive 2 ft. thick soil zones in each grid provided data for evaluation of 192 soil "units" at the site. Each 100 ft. sq. by 2 ft. thick zone was considered a workable unit of soil that could be isolated effectively during remedial action implementation. Any further breakdown that exceeded 192 soil units on an 11 acre site was deemed unnecessary. Sample compositing is an acceptable scientific methodology used for characterizing a particular area. It provides data that are significantly more representative than one grab sample for the entire area.

Field Screening:

These comments were similar to the general comments in Section 2.1. The soil sampling procedures and protocols are presented in Section 3.2 of the RI report. The intent of this, or any soil sampling program, is to provide the nature and extent of contaminated soils. This goal lends itself to the analysis of samples presumed to be contaminated. Analysis of clean samples will allow for a real distribution of clean soils from which contaminated soils delineation could be assumed. However, analysis of clean soils does not allow for the determination of soil contaminant nature. As stated in the RI, "clean" samples were also selected for CLP analysis to verify the accuracy of the screening program.

Cement Plant Soils:

The cement plant soils were designated as background samples during the preparation of the sampling plan. Background samples were chosen from areas that were assumed to be isolated from site-related activities. However, during the course of the remedial investigation, it was clear that the cement plant properly received direct drainage from the site during its active operation prior to rerouting of the southern ditch. The analytical data supported this conclusion. At that time, it was decided that the cement plant soils should be removed from consideration as background. The U.S. EPA has successfully assessed off-site soil contamination that is site related. The background soils were discussed separately in the PHE.

Analytical Results (Soils):

The intent of Section 4 of the RI report was to present the data obtained and assess the nature and extent of site-related contamination in various site media. The potential risks that these site-related contaminants have on the public health and environment are presented in Sections 5 and 6 of the RI report. The commenter statement concerning presentation of volatile organic compounds (VOCs), base/neutral/acids (BNAs), Pesticides/Polychlorinated Biphenyls (PCBs) and inorganic data using total mass can only be applied to the format for presentation and evaluation of data, not assessment of risk. There is not a correlation of total mass of VOC to potential risk. Consideration involving extent of soil removal is more appropriately based on risk reduction rather than contaminant mass reduction. Risk reduction technologies may either increase or decrease contaminant mass but will result in reduction of toxicity and in some cases mobility.

Analytical Results (Surface Water):

Based on water table flow data obtained during the RI investigation, the water table may discharge to the drainage ditches only during periods of high groundwater flow. Surface water flow was intermittent during the RI investigation and, therefore, any component of groundwater flow from the cement plant toward the southern ditch probably had passed beneath the ditch and did not contribute directly to surface water flow.

Analytical Results (Sediments):

U.S. EPA did collect upstream data for sediments from sample numbers SD-011-001 and SD-032-001. These samples were obtained from the same location that was upstream of any effects from the site and are considered representative of background quality in the local drainage system near the site. This was the primary comparison used to indicate a downstream sediment contamination problem. Comparison of sediments to background soils provided an additional analysis that resulted in similar conclusions being made. This further analysis did not rule out that the background soils may be an additional source of off-site sediment contamination. The upstream sample in the south ditch with the highest level of contamination was not the sample used for background.

Analytical Results (Buried Materials):

The further evaluation of the magnetometer data was not performed using any data other than what were provided in the RI report. The evaluation was mainly an ongoing development or reinterpretation of the same magnetometer data. The results of the geophysical investigations are presented as Appendix G of the RI Report Volume II.

A subsurface investigation consisting of parallel trenches across the site would be an expensive and unnecessarily dangerous approach to searching for buried drums, especially since magnetometer data has identified areas most likely to contain buried drums. All drum estimates were made based on visual observation and counting of drums in open this pits and were assumed to be representative of the entire particular anomalous area. Each area that encountered drums was excavated by two trenches that extend between all boundaries of the anomalous area.

SECTION 2.5 CONTAMINANT TRANSPORT AND FATE:

The majority of this Section presents CRA concerns with the RI report. A point of disagreement was concerning contamination in well MW-24 and potential of trace contamination in MW-25. The commenter states that if downward migration was occurring, contamination also would be discovered in well MW-25 at or higher than levels in MW-24. The commenter fails to consider the possibility that the contaminants passed laterally beneath MW-25 or that contaminant transport was affected by fracturing. The commenter makes the statement that in order to minimize off-site migration of contaminants the water table and upper intermediate zones should be the focus of remedial action alternatives. This statement is contradictory to comment number 15 on page 45 of the PRP Group report, when the commenter states that groundwater extraction in the upper intermediate unit should not be contained for detailed analysis in the FS. It is unclear as to what the commenter's real preference is regarding this issue.

SECTION 3.0 PUBLIC HEALTH EVALUATION

General:

Concentrations of indicator chemicals present in groundwater monitoring wells were compared to ARARs in Table 6-9 of the RI report, and the intakes and risks associated with ingestion of groundwater by workers are presented in Tables 6-27, 6-32 and 6-33. Similarly, intakes and potential risks associated with ingestion by future site residents are presented in Tables 6-30, 6-34, and 6-35.

Use of the maximum detected concentration of a chemical in evaluating the plausible maximum exposure scenario is conservative in that it assumes repeated exposure to the maximum concentration. However, the possibility exists that additional sampling may result in concentrations that are greater than the maximum detected during the RI. This comment states that in evaluating the average risks only, presence of PAHs. This subset of chemicals is identified in Table 6-2. Non-carcinogenic PAHs are not quantitatively evaluated in this assessment. As indicated in Table 6-17 of the RI report, the average and maximum concentrations of PCBs in soil near the eastern perimeter of the site are 490 and 540 ug/kg, respectively. Under the exposure scenarios evaluated, these concentrations correspond to cancer risks of $9x10^{-7}$ and $5x10^{-6}$ respectively.

Children Exposed to Sediment in Ditch:

While the exposure assumptions presented on page 6-39 of the RI report, used to evaluate exposure of children to sediment are conservative from a frequency standpoint, exposure is only evaluated over a three year period, while actual exposure may possibly occur less frequently over a longer time period.

Teenager Exposed to Sediment in Impoundments:

No issues raised by the PRPs. The maximum risk is less than 1×10^{-6}.

Exposure to Workers to Soils On-site:

Use of maximum concentrations in evaluating the plausible maximum exposure scenarios has been discussed above. Also as discussed, only carcinogenic PAHs were evaluated in the PHE.

Ingestion of Water by Residents and Workers:

Risks from ingestion of groundwater from the water table, intermediate unit and Upper Sharon unit were presented separately. If the contaminated water table and intermediate unit are not cleaned up, the potential exists that the Upper Sharon could become contaminated.

SECTION 4.0 FEASIBILITY STUDY REPORT

Section 4.1 General

Adequate controls such as deed restrictions in the use of the site are required to assure long term protectiveness of the selected alternatives. The scenario of future risks to on-site residents represents the worst case scenario and justifies a remedial action for the Summit National Site. The risks associated with such an exposure scenario address the main source of contamination. The remedial alternative is designed to minimize threats at the source location and affected areas (i.e. cement plant and eastern perimeter).

SECTION 4.2 REMEDIAL TECHNOLOGY DEVELOPMENT

No issues raised by the PRPs.

Residential Exposure to Soil:

Only carcinogenic polynuclear aromatic hydrocarbons (PAHs) were included in evaluating the risks to off-site residents due to the presence of PAHs. This subset of chemicals is identified in Table 6-2. Non-carcinogenic PAHs are not quantitatively evaluated in this assessment. As indicated in Table 6-17 of the RI report, the average and maximum concentrations of PCBs in soil near the eastern perimeter of the site are 490 and 540 ug/kg, respectively. Under the exposure scenarios evaluated, these concentrations correspond to cancer risks of $9x10^{-7}$ and $5x10^{-6}$ respectively.

Children Exposed to Sediment in Ditch:

While the exposure assumptions presented on page 6-39 of the RI report, used to evaluate exposure of children to sediment are conservative from a frequency standpoint, exposure is only evaluated over a three year period, while actual exposure may possibly occur less frequently over a longer time period.

Teenager Exposed to Sediment in Impoundments:

No issues raised by the PRPs. The maximum risk is less than 1×10^{-6}.

Exposure to Workers to Soils On-site:

Use of maximum concentrations in evaluating the plausible maximum exposure scenarios has been discussed above. Also as discussed, only carcinogenic PAHs were evaluated in the PHE.

Ingestion of Water by Residents and Workers:

Risks from ingestion of groundwater from the water table, intermediate unit and Upper Sharon unit were presented separately. If the contaminated water table and intermediate unit are not cleaned up, the potential exists that the Upper Sharon could become contaminated.

SECTION 4.0 FEASIBILITY STUDY REPORT

Section 4.1 General

Adequate controls such as deed restrictions in the use of the site are required to assure long term protectiveness of the selected alternatives. The scenario of future risks to on-site residents represents the worst case scenario and justifies a remedial action for the Summit National Site. The risks associated with such an exposure scenario address the main source of contamination. The remedial alternative is designed to minimize threats at the source location and affected areas (i.e. cement plant and eastern perimeter).

SECTION 4.2 REMEDIAL TECHNOLOGY DEVELOPMENT

No issues raised by the PRPs.

SECTION 4.3 SCREENING OF REMEDIAL TECHNOLOGIES

Soil Access Restrictions

Comment:

The PRPs state that the site extension is unnecessary.

U.S. EPA's Response:

The site extension is not based solely on soil remediation. The boundaries were also extended to contain the groundwater plume in the water table aquifer and also to implement the other components of the selected alternative such as the slurry wall, cap, and rerouting of the lower eastern and southern ditches.

Containment

Comment:

According to the PRPs, a soil cover is more appropriate than a RCRA cap.

U.S. EPA's Response:

The FS does evaluate surface controls in the context of containment of contaminated soil/sediment/subsurface waste technologies. Revegetation and soil cover were carried through Chapter 3, and revegetation was carried through Chapter 4 and into the assembly of alternatives. Surface sealing and soil stabilization were screened out in Chapter 3 primarily since they are both temporary solutions and do not meet the goals of the NCP. Leaching of contaminants is an additional factor used to screen out soil stabilization. A soil cover does not meet the criteria for protectiveness or long term effectiveness based on the waste characteristics at the Summit National Site. The requirements to repair topsoil and revegetate every ten years is a common industry standard that is based on past experience and used as a basis for estimating operating and maintenance costs. Whether repair is the result of poor management or other factors is not at issue.

Removal

Comment:

The PRPs claim that risk numbers and the scenario for subsurface soils are illogical. Buried drum delineation needs to be defined adequately.

U.S. EPA's Response:

Additional delineation and estimates of numbers of drums will be performed during the pre-design investigation. The data gathered during the remedial investigation represent the best estimate and effort. The actual number of drums can only be determined through excavation and removal. This action is more appropriate during the remedial action. Prior to remedial alternative implementation during the design phase, the number of drums will be better estimated to develop costing and design plans. The scenario of exposure to subsurface soils through dermal contact and incidental ingestion is appropriate to consider when defining the extent to which "hot spot" soils require treatment.

Initially, the grid square (2-4) with a 1 x 10^{-4} risk was not included in the "hot spot" soils removal scenario. However, after further consideration of soil block units exceeding the cancer risk of 1 X 10^{-5}, a more protective soil removal scenario has been developed. Soil block units with a risk less than 10^{-5} risk are shallow (0-2 ft) and will be covered by a cap to prevent direct contact and exposure through ingestion. The concept of addressing "hot spot" soils is not to provide complete treatment but to provide a cost effective alternative that eliminates a substantial source of risk while being cost-effective. The "hot spot" delineation is located primarily on the southern half of the site where the buried drums were identified.

The delineation of "hot spot" soils for removal and the delineation of the area to be capped are based on two different issues. Treatment of "hot spots" to address reduction in mobility, toxicity, and volume is based on a cost effective volume that reduces a majority of risk. Placement of the cap is required over the entire site to contain treated soils and reduce exposure to unacceptable soil contamination.

Comment:

According to the PRPs, the storage capacity is insufficient for stockpiling soils.

U.S. EPA's Response:

The temporary staging of soils under the pole building should never reach the capacity of the building. Soils will be stored temporarily (several days) until fed into the incinerator. This is an ongoing practice and not intended to serve as long-term storage.

Comment:

The PRPs claim that the 85,000 c.y of soil was increased arbitrarily to 105,000 c.y.

U.S. EPA's Response:

Soil blocks exceeding cancer risks of 1 x 10^{-6} are equivalent to 85,000 c.y. When considering cost sensitivity and technical implementability, the location of certain contaminated soil blocks result in the unavoidable removal of clean soil blocks. To work around such blocks is impracticable and cumbersome resulting in increased construction costs. The 105,000 c.y. of soils proposed for removal results in the most cost-effective and practicable method for the contaminated vadose soil removal scenario.

Comment:

The PRPs state that excavation of all unconsolidated material is unrealistic.

U.S. EPA's Response:

The alternative to remove all unconsolidated material represents the maximum extent of treatment possible at the site resulting in no residual contamination that eliminates long-term management. This alternative is extremely difficult to implement and is very costly.

Surface Water and Groundwater Treatment
Comment:

The PRPs state that the influent is not chemically characterized.

U.S. EPA's Response:

The chemical characteristics of the influent are currently based on surface water and groundwater analytical results from the remedial investigation. A treatability study could be conducted prior to installing the treatment process to assure it's removal efficiency rate. This treatability study will be conducted during the remedial design phase. In waste water treatment design, there are key compounds that process design engineers look for, that if present at certain concentrations, can create problems for treatment systems. No such chemicals at restrictive concentrations have been detected at the Summit National Site.

Groundwater Operable Unit Vertical Barrier:
Comment:

The PRPs believe that hydraulic containment at the site perimeter would accomplish the same objective as the containment wall.

U.S. EPA's Response:

During the technology screening process leading to alternative development the use of hydraulic containment through other process options under vertical barriers was evaluated. The soil bentonite slurry wall was the only option that passed through screening for its ability to minimize lateral migration of contaminated groundwater. An additional feature of the slurry wall is that it can prevent lateral migration of groundwater from clean up-gradient sources into the contaminated area beneath the site. The permeability of 10^{-7} cm/sec that can be achieved by a soil bentonite slurry wall does not depend on the permeability of natural soils used. The higher the permeability of natural soils, the higher the portion of bentonite that will be used. The 10^{-6} permeabilities of surrounding soils presents the lower range. The higher range of permeabilities was estimated at 10^{-3}.

Based on current available hydrogeologic data, drains (hydraulic control) may not be technically feasible due to the hydraulic conductivity of on-site soils. An additional concern is that drains would not be effective in dewatering the water table adequately to prevent downward vertical migration of contaminants into the upper intermediate unit.

Low Permeability Cover
Comment:

The PRPs claim that a low permeability soil cover is not necessary since soil leachability is low and groundwater treatment is less costly than constructing the cap.

U.S. EPA's Response

Using the current quality of the water table aquifer one can assume that the contaminated soils or buried wastes leach sufficient concentrations of chemicals to necessitate treatment. Those levels, however, are not a problem for treatment.

By not using a low permeability cover, the collection and treatment of contaminated groundwater will continue indefinitely. At some point in time, this perpetual treatment would exceed eventually the cost of a RCRA cap.

Groundwater Extraction/Collection
Comment:

According to the PRPs, the FS has arbitrarily included the low permeability (RCRA) cap and containment wall with the groundwater collection system.

U.S. EPA's Response:

The RCRA cap is an integral component of the groundwater extraction and gradient stabilization system included with the proposed alternative, not an arbitrary addition as the comments suggest. Groundwater remediation and gradient control considerations are presented in Appendix B and C of the FS.

Singular component technologies such as pipe or media drains, typical extraction wells and radial collection wells passed Chapter 3 screening as being able to achieve the general response goal established and suitable to site characteristics. Only radial collection wells were eliminated in Chapter 4 of the FS, due to high cost and unacceptable health and safety risk to workers.

The groundwater extraction system designed to dewater the water table aquifer was developed based on concepts presented in Appendices B and C of the FS report. The point that the commenter makes where reduction of the water table by greater than one foot would cause a gradient reversal is only true in one area; that is the extreme southern portion of the site. This is because the base of the water table is slightly lower and the piezometric surface on the Upper Sharon unit is slightly higher. At other locations at the site much more drawdown is necessary.

Perimeter drains were not considered for alternatives that included partial removal of soils. They were screened out due to extensive costs to include wall shoring, dewatering, and safety during installation. Constructability of a drain system would also be very difficult. Also perimeter drains alone are inadequate due to limited radius of influence due to hydraulic conductivities at the site. In Alternative 7 when all unconsolidated materials were removed, gravel trench drains were used since they will be constructed simultaneously during the backfilling operation.

The groundwater extraction and gradient control system the U.S. EPA has proposed for its recommended alternative is complex but is based on the available data. More data needs to be collected during the remedial design to refine the system. If additional hydrogeologic data collected during the design phase shows a more permeable system exists than some of the current data suggests, then the number of wells could be reduced and costs would also be lowered. If fewer drains were also required they may prove to be more economical. The commenters statement that the costs for the proposed extraction system are underestimated by a factor of three is an unsupported opinion. Costs are based on published reference and industry contacts which resulted in what U.S. EPA believes are adequate estimates to comply with +50 and -30 reliability.

Again the commenter now says they do not believe that intermediate zone groundwater extraction wells are warranted or advisable. This is the third instance the commenter changes their technical opinion on this issue.

In summary U.S. EPA has stated that more data are necessary to refine the proposed groundwater extraction system. That data will be collected during design and may or may not have significant changes on cost or technologies of the currently proposed system.

4.4 ALTERNATIVES DEVELOPMENT

General Comment:

The PRPs claim that the Feasibility study fails to evaluate the reduction of risk associated with each alternative.

U.S. EPA's Response:

Alternatives 3 through 9 eliminate risks associated with the site, although through different combinations of treatment, engineering, and institutional controls. Since all exposure routes are eliminated, no residual risks would occur providing there is no interference or failure of the components of the remedial alternative.

Comment:

The PRPs state that the residual risk in Alternative 5 is minute.

U.S. EPA's Response:

It is true that the exposure pathway to untreated soils is eliminated by the installation of the multi-layer cap. The purpose of risk numbers for each soil block is to define the "hot spot" soils and the extent of residual contamination allowable at the site. The overall risk associated with the remaining cells is 3×10^{-5}, which is acceptable for containment rather than treatment.

Comment:

The PRPs prefer that the effectiveness of the alternatives be evaluated in terms of contaminant mass:

U.S. EPA's Response

As previously discussed, contaminant mass is not indicative of health risks. In addition, contaminant mass does not relate to clean-up standards and therefore, this criteria would be inappropriate to evaluate effectiveness.

Comment:

The PRPs propose that intermediate alternatives between Alternative 2 and 3 need to be evaluated.

U.S. EPA's Response:

Alternative 2 represents the minimum action with no treatment or containment options. Alternative 3 represents containment with treatment of the major source of contamination which is drums for this particular site. U.S. EPA considers the range between Alternatives 2 and 3 reasonable and appropriate.

Detailed Analysis of Assembled Alternatives Effectiveness and Implementability

Comments made by the PRPs regarding reduction in risks, total mass of contaminants, volume of 430,000 c.y. and cost effectiveness have been previously discussed in this document.

Comment:

The PRPs claim that a soil cover is less costly than a multi-layer cap.

U.S. EPA's Response:

As previously discussed, a soil cover does not provide proper containment due to its potential for cracking and leaking caused by natural freeze/thaw cycles, and it also does not eliminate infiltration which is an important function of the cap.

The initial screening of a viable alternative is primarily based on its ability to be effective and implementable. Cost effectiveness is a significant factor but it is not the primary decisive factor. If two or more alternative provide similar results in effectiveness and implementability, then cost effectiveness could be used as the decisive factor. However, this is not the case for a soil cover versus a multi-layer cap based on the waste characteristics at the Summit National Site.

Cost Analysis
Comment:

According to the PRPs, the cost analysis fails to provide construction and capital costs on a yearly basis to account for sequential implementation of various cost items.

U.S. EPA's Response:

It is important that all costs are prepared using an equal and comparable methodology to allow for direct comparison of alternatives that contain different technologies and are implemented over different periods of time. Cost estimates for the assembled alternatives were prepared from cost information included in the U.S. EPA's "Compendium of Costs of Remedial Technologies at Hazardous Waste Sites," the 1987 Means Site Work Cost Data guide, U.S. EPA's "Remedial Action at Waste Disposal Sites Handbook," estimates for similar projects, and estimates provided by equipment vendors.

All capital costs and operations and maintenance costs are carried to a present worth based on 30 years at 10% interest rate. The order-of-magnitude cost estimates presented have been prepared from the information available at the time of the estimate. Final costs of assembled alternatives will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions, final project scope, final project schedule continuity of personnel, engineering between the feasibility study and final design, and other variable factors. As a result, the final alternative costs will vary from the estimates presented in this report. Most of these factors are not expected to affect the relative cost differences between alternatives. Factors that may substantially affect the relative cost difference are discussed under "Cost Sensitivity Analysis". Because of these factors funding needs must be carefully reviewed prior to making specific financial decisions or establishing final budgets.

SECTION 5.0 - PRP'S PREFERRED REMEDIAL ACTION ALTERNATIVES

U.S. EPA has already provided comments to the PRP's proposed alternative in responding to the CRA's Report in the Executive Summary. The two differences between U.S. EPA's recommended alternative and the PRP's, are the issues of the soil cover and the groundwater extraction/gradient control system. The issue regarding soil cover versus RCRA cap is fairly straight forward since a RCRA cap is a regulatory requirement. U.S. EPA believes that some additional discussion on the containment, collection, and extraction of groundwater is warranted.

Based on current data available on site hydrogeologic conditions, the system proposed by the PRPs would not dewater the water table adequately to prevent vertical downward movement of contaminants into the upper intermediate unit. For a system similar to that shown on Figure 5.1, an up-gradient drain would probably need to be installed to intercept water recharging the water table aquifer from north of the site. Additionally, several more north-south oriented drains would be required to adequately dewater the water table aquifer based on current hydraulic conductivity data. The radius of influence of drains proposed on Figure 5.1 is much larger than estimated based on RI data. The proposed system may be feasible based on the refinement of data during the Remedial Design phase, but current data indicates it would not achieve groundwater remediation objectives.

RI/FS Comments Submitted by the Summit National PRP Group - March 11, 1988:

This document presents comments concerning legal and technical matters. The legal comments presented in Section II have been addressed previously in this document under the section entitled "Legal Comments". The technical issues are generally based on the report prepared by the PRP consultants, Conestoga-Rovers & Associates (CRA).

The detailed technical issues raised by the PRP's consultants, CRA, were presented in Attachment E. These comments have been responded to by U.S. EPA in the previous section entitled "Technical Comments". In reviewing the PRP document, there are some technical and procedural comments that were not raised in the CRA document. The following section includes responses to those comments.

Section I - Introduction

Section I of the PRP Group report presents numerous comments that have already been addressed during the discussion of the CRA report. The issues already responded to include the interceptor and collector drain system, excavation of offsite soils with low levels of contamination, volume of "hot spot" soils, and the use of an impermeable cover. The commenter later addresses excavation of offsite soils that are "significantly contaminated" (page 6) which is inconsistent with their previous comments about offsite soils with low levels of contamination (page 4). It is not clear exactly what soils the commenters are referring to. The PRP Group goes on to state that they are basically in agreement with U.S. EPA's proposed alternative. The two differences, groundwater collection and soil cover, have been previously addressed. The need for an exploratory trench program to delineate buried drums and the removal of "hot spot" soils based on mass instead of risk have also been addressed.

The commenters note that the Agency for Toxic Substance and Disease Registry (ATSDR) has not presented a health assessment. ATSDR is currently developing the health assessment for the Summit National Site. The health assessment is based on the Remedial Investigation and Feasibility Study report. The health assessment will be completed by the time this Record of Decision is signed by the U.S. EPA.

Section II:

This section refers to legal matters which have been previously addressed.

Section III:

This section presents specific comments on the RI report. All issues presented in this section have been responded to during the review of the CRA report. These include comments on "other potential shortcomings" numbers 1-3 and 5-16. The PRP comment No. 4 concerning adjacent subsurface soil samples needs further clarification. The two foot vertical interval used for soil characterization represents a common sample interval (split spoon samples). Also as previously discussed, this will provide 192 2-ft. thick soil units for evaluation at the site, which were deemed sufficient. The fact that certain soils were loose such as fill, and a 3 or 4 ft. interval was required to obtain sufficient sample volume is beyond control. The adjacent split spoon samples were taken vertically and may in fact represent an interval larger than 2 feet.

Section IV:

This section presents specific comments on the FS report. All issues presented in this section have been responded to during the review of the CRA report. These include comments or deficiencies numbered 1 through 23.

General comments were made stating that the FS did not provide applicable screening of technologies. The identification and initial and detailed screening of technologies allows for a more thorough evaluation of applicable remedial technologies. Chapter 3 of the FS screens technologies on the basis of their compatibility with site conditions and waste characteristics. Those applicable technologies are then screened with respect to effectiveness, implementability, and cost. This screening process is in accordance with the NCP and U.S. EPA's FS guidance.

Comment:

The PRPs state that technologies such as polymerization, bioreclamation, and critical fluid extraction were eliminated because of their experimental and unproven nature, yet in-situ vitrification was retained.

U.S. EPA's Response:

Certain technologies were not screened out not based solely on its experimental and unproven nature but also the uncertainty of its compatibility with waste characteristics. SARA Section 105 authorizes the use of innovative technologies that are appropriate for utilization in response actions. Vitrification applies to soil remediation and appears promising in its application to hazardous waste site remediation. However, for this particular site, incineration was selected as the preferred treatment technology based on feasibility and implementability.

Comment:

The commenters noted that the detailed analysis of alternatives does not include the proper criteria by the NCP.

U.S. EPA's Response:

The FS for the Summit National Site is consistent with SARA and U.S. EPA's Office of Solid Waste and Emergency Response (OSWER) directives for evaluation of alternatives. The detailed analysis follows U.S. EPA's evaluation criteria. Effectiveness includes an evaluation on protectiveness, reliability, meeting ARARs, and reduction in toxicity, mobility and volume. Implementability includes technical feasibility, availability, and administrative feasibility. Finally a cost analysis which includes capital, operations and maintenance costs. In conclusion all alternatives were properly evaluated and is accordance with the NCP.

Comment:

The PRPs state that the FS cannot be finalized without an evaluation on community acceptance.

U.S. EPA's Response:

The FS is entitled "The Public Comment Feasibility Study" and has undergone public review. Based on public comments received by the community there is no justifiable cause to reopen the FS.

Finally, Section 5 presents the PRP's proposed alternative which has already been commented on in the CRA report review.

U.S. EPA's Response:

The FS is entitled "The Public Comment Feasibility Study" and has undergone public review. Based on public comments received by the community there is no justifiable cause to reopen the FS.

Finally, Section 5 presents the PRP's proposed alternative which has already been commented on in the CRA report review.

Attachment 2 - Index to the Administrative Record

administriative Record Index
not included.

Attachment 3 - Summary of Most Representative Contaminants in each media for the Summit National Site

Attachment 3

List of Tables

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TABLE 3-1

MOST REPRESENTATIVE ORGANIC CONTAMINANTS IDENTIFIED
IN THE SHALLOW GROUNDWATER SYSTEM
SUMMIT NATIONAL SITE

Contaminant	Area Affected	Maximum Conc. (ug/l)	Background Conc. (ug/l)	Comments
VOLATILES				
Methylene Chloride	Southwestern quadrant	24,000	2**	
Acetone	Southern half of site	1,300,000	4**	
1,1-Dichloroethane	Southern half of site	12,000	ND	Tends to occur at higher concentrations in shallower wells
1,2-Dichloroethane	Southern half of site	115,000*	ND	
2-Butanone	Southern half of site	650,000	14**	
1,1,1-Trichloroethane	Southern half of site	53,000	ND	Tends to occur at higher concentrations in shallower wells
Trichloroethene	Southern half of site	27,000	16	Tends to occur at higher concentrations in shallower wells
4-Methyl-2-Pentanone	Southwestern quadrant	62,000	ND	Tends to occur at higher concentrations in shallower wells
Toluene	Southwestern quadrant	18,000*	16**	Tends to occur at higher concentrations in deeper wells
Ethylbenzene	Southern half	11,000	ND	Tends to occur at higher concentrations in shallower wells
SEMI-VOLATILES				
4-Methylphenol	Southwest quadrant	510	ND	
2,4-Dimethylphenol	Southwest quadrant	130*	ND	
Phenol	Southwest quadrant	7,000	ND	
Isophorone	Southern half of site	2,600	ND	Tends to occur at higher concentrations in deeper wells
Naphthalene	Southwest quadrant	620	ND	Tends to occur at higher concentrations in shallower wells
2-Methylnaphthalene	Southwest quadrant	370	ND	Tends to occur at higher concentrations in shallower wells
Bis(2-ethylhexyl)Phthalate	Southern half of the site	7,250*	5	Tends to occur at higher concentrations in deeper wells

Note:

MW-7 used for background concentration

* Average of 2 duplicates, duplicates not averaged had one value of 0

** Concentration level can be attributed to lab contamination

TABLE 3-2

IDENTIFIED ORGANIC CONTAMINANTS DETECTED IN MW-24
SUMMIT NATIONAL SITE

Contaminant	Concentration in MW-24	Concentration in MW-25	Concentration in MW-22	Maximum Concentration in Water-Table Aquifer
Methylene Chloride	180 ug/l	3 ug/l	1 ug/l	24,000 ug/l
Acetone	2,700	13	9	1,300,000
1,1-Dichloroethane	820	5	ND	12,000
1,2-Dichloroethane	5,800	100	ND	115,000
2-Butanone	1,800	15	15	650,000
1,1,1-Trichloroethane	360	3	ND	53,000
Trichloroethene	55	ND	ND	18,000
4-Methyl-2-Pentanone	250	ND	ND	62,000
Toluene	3,200	9	ND	27,000
Ethylbenzene	590	ND	ND	11,000
4-Methylphenol	140	ND	ND	510
Isophorone	41	ND	ND	2,600
2,4-Dimethylphenol	16	ND	ND	140
Naphthalene	11	ND	3	620
2-Methylnaphthalene	5	ND	3	370

ND - Not Detected

TABLE 3-3

SUMMARY LIST OF ORGANIC PARAMETERS IDENTIFIED
IN BACKGROUND (1) SOILS
SUMMIT NATIONAL SITE

Volatile Parameters	Number of Times Detected (2)	Range of Detected Concentrations (3)	Mean Concentration(3)(4)	Standard Deviations(3)	Upper 95% Confidence Limit (3)
Toluene	14	4J - 31	9	8	13
Total Xylenes	2	6 - 7	1	2	2
BNA Parameters					
Benzoic Acid	3	160J - 1100J	126	331	297
Naphthalene	10	110J - 3500	859	1124	1438
2-Methylnaphthalene	11	55J - 3700	972	1196	1587
Acenaphthylene	2	83J - 150J	14	40	35
Dibenzofuran	8	230J - 810	212	265	349
Fluorene	2	65J - 94J	9	27	23
Hexachlorobenzene	1	330J	19	80	61
Pentachlorophenol	1	87J	5	21	16
Phenanthrene B	15	42J - 2400	725	712	1091
Anthracene	3	67J - 280J	30	76	69
Di-N-Butylphthalate	6	49J - 270J	45	79	86
Fluoranthene	16	69J - 2100	353	470	594
Pyrene	16	54J - 1500	331	352	512
Benzo(a)Anthracene	14	59J - 1000	222	241	346
Bis(2-ethylhexyl)Phthalate	8	40J - 120	32	39	52
Chrysene	15	47J - 1100	268	302	423
Benzo(b)Fluoranthene	14	49J - 1900	351	480	598
Benzo(k)Fluoranthene	14	49J - 1900	351	480	598
Benzo(a)Pyrene	11	65J - 1100	161	271	301
Indeno(1,2,3-cd)Pyrene	4	82J - 550	68	158	150
Dibenz(a,h)Anthracene	2	97J - 120J	13	36	31
Benzo(g,h,i)Perylene	4	150J - 470	65	136	135
Pesticides/PCB's					
None	--	--			

Notes:

(1) - Includes residential, farm and mine soil samples
(2) - Out of total 17 samples
(3) - Units - ug/kg
(4) - Mean calculated using zero for samples where parameters not detected
J - Estimated Value
B - Found in laboratory blank

TABLE 3-3
(con't)

SUMMARY LIST OF INORGANIC PARAMETERS IDENTIFIED
IN BACKGROUND SOILS (1)
SUMMIT NATIONAL SITE

Parameter	Number of Times Detected (2)	Range of Detected Concentrations (3)	Mean Concentration (3)(4)	Standard Deviations(3)	Upper 95% Confidence Limit (3)
Aluminum	17	4070 - 18100	9661	3964	11699
Antimony	1	[20]R	1	5	4
Arsenic	16	[5.8] - 26	16	6	19
Barium	17	[28] - [145]	85	29	100
Beryllium	15	[0.32] - [1.3]	0.54	0.538	0.726
Cadmium	11	[2.3] - 4.1	2	2	3
Calcium	14	[201] - 5510	3253	7903	7316
Chromium	17	12 - 24	17	3	18
Cobalt	17	[5.9] - 21	11	4	13
Copper	17	[16] - 51	25	9	29
Iron	17	16600 - 39400	25694	7543	29572
Lead	17	17 - 391	66	98	117
Cyanide	8	.69 - 4.2	0.65	1.045	1.186
Magnesium	17	[1720] - 5340	2356	829	2782
Manganese	17	105J,R - 1580J,R	729	531	1003
Mercury	3	[.095] - .38	0.043	0.108	0.098
Nickel	17	[11] - 38	16	6	19
Potassium	17	[905] - [3100]	1832	639	2161
Silver	10	[2.5]J,R - 16J,R	3	4	5
Sodium	1	[779]	46	189	143
Vanadium	17	[14] - [36]	24	6	26
Zinc	17	50 - 227	87	49	113

Notes:

(1) Includes residential, farm, and mine soil samples
(2) Out of total 17 samples
(3) Units - mg/kg dry weight
(4) Mean calculated using zero for samples where parameters not detected
[] - Positive value less than contract required detection limit
R - Spike sample recovery not within contract limits
J - Estimated value

TABLE 3-4

SUMMARY LIST OF INORGANIC PARAMETERS IDENTIFIED
IN ONSITE SURFACE SOILS THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Inorganic Parameters	Number of Times Detected (1) Onsite	Range of Detected Concentrations (2) Onsite	Mean Concentrations (2)(3) Onsite	Standard Deviation (2) Onsite	Upper 95% Confidence Limit in Background Samples (2)	Upper 95% Confidence Limit in Residential Soil Samples (2)
Antimony	11	[16]R-545R	17	71	4	ND
Arsenic	53	7.35-[35]R	17	9	19	24
Barium	61	[39]-343	103	58	100	133
Beryllium	36	[0.32]-[1.9]	0.59	0.56	0.726	1.074
Cadmium	13	[2.4]-112	3	14	3	3
Calcium	61	[864]-38029	8982	9281	7316	4289
Chromium	61	8.7-102	27	18	18	23
Cobalt	48	[4.6]-[28]	11	8	13	18
Copper	61	[7]-175	37	27	29	43
Cyanide	37	0.31*-43.6	4	11	1.186	2.895
Iron	61	11489-95300	39531	18264	29572	30494
Magnesium	60	[326]-6120	2827	1344	2782	4142
Manganese	61	29-2620	365	346	1003	1362
Mercury	36	[0.084]-0.81	0.167	0.198	0.098	0.289
Nickel	58	[5.3]-56	26	12	19	30
Selenium	2	3R-8.2R	0	1	ND	ND
Sodium	34	[106]-[1280]	164	229	143	ND
Tin	7	[13]R-106	3	14	ND	ND
Vanadium	61	[14]-62	28	12	26	32
Zinc	61	24-803	168	149	113	197

(1) Out of total 61 samples
(2) Units mg/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
R Spike recovery not within control limits
[ ] Positive values less than the contract required detection limit
S Value determined by standard addition

TABLE 3-4
(con't)

SUMMARY LIST OF VOLATILE PARAMETERS IDENTIFIED IN ONSITE SURFACE SOILS THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Volatile Parameters	Number of Times Detected (1) Onsite	Range of Detected Concentrations (2) Onsite	Mean Concentrations (2)(3) Onsite	Standard Deviation (2) Onsite	Upper 95% Confidence Limit in Background Samples (2)	Upper 95% Confidence Limit in Residential Soil Samples (2)
Methylene Chloride	22	3.8-18000B	406	2375	ND	ND
Acetone	25	6J-520000B	9484	66152	ND	ND
Carbon Disulfide	3	5-10	0	2	ND	ND
1,1-Dichloroethene	2	3.2-33	1	4	ND	ND
1,1-Dichloroethane	5	7-15	1	3	ND	ND
Trans-1,2-Dichloroethene	7	2.4-381	9	49	ND	ND
Chloroform	10	2J-4300J,**	72	546	ND	ND
1,2-Dichloroethane	9	44-80000**	3177	14120	ND	ND
2-Butanone	15	5J-38000B,**	1682	6901	ND	ND
1,1,1-Trichloroethane	31	3J-51000**	2216	9022	ND	ND
Trichloroethene	38	2J-160000**	8017	30691	ND	ND
1,1,2-Trichloroethane	2	14-48	1	6	ND	ND
Benzene	30	1J-24	3	5	ND	ND
Hexanone	5	19-4400**	146	783	ND	ND
4-Methyl-2-Pentanone	2	78-45000**	739	5714	ND	ND
Tetrachloroethene	12	1J-4600J,**	97	604	ND	ND
Toluene	40	2.2-260000**	7002	34207	ND	ND
Chlorobenzene	9	4J-3600**	62	457	13	11
Ethylbenzene	18	3.7-180000**	4882	24924	ND	ND
Total Xylenes	27	7.3-730000**	20440	101649	2	ND

(1) Out of total 61 samples

(2) Units ug/kg dry weight

(3) Mean calculated using zero for samples where parameters not detected

J Estimated value

B Found in laboratory blank, indicates possible/probable contamination

** Analyzed at medium concentration

ND Not detected

TABLE 3-4
(con't)

SUMMARY LIST OF BNA AND PESTICIDE/PCB PARAMETERS IDENTIFIED IN ONSITE SURFACE SOILS THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

BNA Parameters	Number of Times Detected (1) Onsite	Range of Detected Concentrations (2) Onsite	Mean Concentrations (2)(3) Onsite	Standard Deviation (2) Onsite	Upper 95% Confidence Limit in Background Samples (2)	Upper 95% Confidence Limit in Residential Soil Samples (2)
Phenol	8	290J-44000**	1304	6368	ND	ND
1,3-Dichlorobenzene	2	330J	11	59	ND	ND
1,4-Dichlorobenzene	4	76J-18000J,**	304	2285	ND	ND
1,2-Dichlorobenzene	9	52J-140000**	3811	19627	ND	ND
2-Methylphenol	6	310J-4800	165	689	ND	ND
4-Methylphenol	4	45J-830	29	136	ND	ND
Isophorone	4	63J-3000	111	533	ND	ND
2,4-Dimethylphenol	5	800J-7000	213	966	ND	ND
Benzoic Acid	6	1,600J-8000J	370	1299	297	885
1,2,4-Trichlorobenzene	6	330J-14000	293	1786	ND	ND
Naphthalene	30	260J-43000**	1965	5883	1438	1214
2-Methylnaphthalene	30	370-14000	1856	3410	1587	1726
Hexachlorocyclopentadiene	3	53000**-2800000**	84475	456241	ND	ND
Acenaphthene	7	48J-1600J	69	252	35	106
Diethylphthalate	8	330J-1600J	95	283	ND	ND
Fluorene	10	65J-1600J	81	256	23	71
N-Nitrosodiphenylamine	5	800J-1600J	79	279	ND	ND
Hexachlorobenzene	21	48J-250000**	8811	38049	61	196
Phenanthrene	28	270J-13000J,**	1095	2231	1091	1122
Anthracene	2	1600J-13000J,**	239	1660	69	199
Di-N-Butylphthalate	23	140J,B-12000J,**	1538	3107	86	213
Butylbenzylphthalate	11	330-12000J,**	592	2052	ND	ND
Bis(2-ethylhexyl)Phthalate	47	550B-3300000**	103511	453957	52	107
Di-N-Octyl Phthalate	30	48J-170000**	7925	28180	ND	ND
Pesticide Parameters						
Heptachlor Epoxide	2	19.8J-20J	1	4	ND	ND
PCB's (4)	19	40J-590000C,**	17058	83969	ND	ND

(1) Out of total 61 samples
(2) Units ug/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
(4) Arochlor 1232, 1242, 1248, 1254
J Estimated value
** Analyzed at medium concentration
B Found in laboratory blank, possible/probable contamination
ND Not detected
C Identification confirmed by GC/MS

TABLE 3-5

SUMMARY LIST OF VOLATILE PARAMETERS IDENTIFIED
IN ONSITE SOILS (2-4 FT.) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Volatile Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentrations (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit In Background Samples (2)
Methylene Chloride	1	470J,B	59	155	ND
Acetone	3	120B-17000B,**	2263	5579	ND
Carbon Disulfide	4	3J-20	6	7	ND
1,1-Dichloroethene	1	430J	54	142	ND
1,1-Dichloroethane	2	14-430J	56	142	ND
Trans-1,2-Dichloroethene	2	1400J-7700**	1138	2522	ND
1,2-Dichloroethane	2	81-3200J	410	1055	ND
2-Butanone	2	45000B,J-49000B,**	11750	20376	ND
1,1,1-Trichloroethane	5	10-43000**	8391	15255	ND
Trichloroethene	5	5-140000**	21502	45996	ND
1,1,2-Trichloroethane	1	510J	64	169	ND
Benzene	6	1J-110	26	34	ND
4-Methyl-2-Pentanone	3	14-15000J	2577	5040	ND
Tetrachloroethene	3	3J-3800J,**	476	1256	ND
Toluene	8	17-46000J	6990	15027	13
Chlorobenzene	4	11-670J	98	217	ND
Ethylbenzene	7	7-3800J	916	1553	ND
Total Xylenes	8	11-30000J	6083	10771	2

(1) Out of total 8 samples

(2) Units ug/kg dry weight

(3) Mean calculated using zero for samples where parameters not detected

J Estimated value

B Found in laboratory blank, indicates possible/probable contamination

** Analyzed at medium concentration

ND Not detected

TABLE 3-5
(con't)

SUMMARY LIST OF BNA AND PESTICIDE/PCB PARAMETERS IDENTIFIED
IN ONSITE SOILS (2 - 4 FT.) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Semi-Volatile Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentrations (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit in Background Samples (2)
Phenol	2	52J-3300	419	1089	ND
1,4-Dichlorobenzene	2	76J-1500J	197	493	ND
1,2-Dichlorobenzene	1	8300	1038	2745	ND
4-Methylphenol	1	68J	9	22	ND
2,4-Dimethylphenol	1	190J	24	63	ND
Benzoic Acid	1	9300	1163	3076	297
1,2,4-Trichlorobenzene	1	4200	525	1389	ND
Naphthalene	7	200J-27000**	5197	8493	1438
2-Methylnaphthalene	7	310J-44000**	8030	13854	1587
Dibenzofuran	6	120J-6300J,**	1468	2062	349
Fluorene	5	59J-2800J,**	527	916	23
Hexachlorobenzene	1	5800	725	1918	61
Phenanthrene	6	290J-16000**	3506	5113	1091
Di-N-Butylphthalate	5	150J,B-1800B	675	670	86
Fluoranthene	6	59J-2200J,**	760	840	594
Pyrene	6	160J-3600J,**	903	1159	512
Butylbenzylphthalate	1	2200	275	728	ND
Benzo(a)anthracene	4	78J-3000J,**	580	984	346
Bis(2-ethylhexyl)Phthalate	6	58J-130000	16622	42857	52
Chrysene	5	76J-2700J,**	522	880	423
Di-N-Octyl Phthalate	1	13000	1625	4299	ND
Indeno(1,2,3-cd)Pyrene	3	68J-1400J	194	457	150
Benzo(g,h,i)Perylene	4	73J-1200J	207	384	135
Pesticides					
Heptachlor Epoxide	1	550**	69	182	ND
PCB's (4)	1	6400C	800	2117	ND
Mirex	1	9000**	1125	2976	ND

(1) Out of total 8 samples
(2) Units ug/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
(4) Arochlor 1232, 1242, 1248, 1254
J Estimated value
B Found in laboratory blank, possible/probable contamination
C Identification confirmed by GC/MS
** Analyzed at medium concentrations

TABLE 3-5
(con't)

SUMMARY LIST OF INORGANIC PARAMETERS IDENTIFIED IN ONSITE SOILS (2 - 4 FT.) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentrations (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit In Background (2)
Arsenic	8	14-61J	24	15	19
Barium	8	[61]-245	130	62	100
Beryllium	6	[0.49]-[0.93]	0.61	0.37	0.726
Cadmium	3	[2.7]-13	4	5	3
Chromium	8	9-732	102	238	18
Copper	8	22-43	34	6	29
Mercury	4	[0.074]-0.32	0.12	0.14	0.098
Nickel	8	[8.6]-27	20	7	19
Selenium	1	5.15	1	2	ND
Thallium	1	[5.9]	1	2	ND
Tin	2	[15]-[20]	4	8	ND

(1) Out of total 8 samples

(2) Units mg/kg dry weight

(3) Mean calculated using zero for samples where parameters not detected

[ ] Positive values less than the contract required detection limit

J Estimated value

TABLE 3-6

SUMMARY LIST OF BNA AND PESTICIDE/PCB PARAMETERS IDENTIFIED IN ONSITE SOILS (4 - 6 FT.) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

BNA and PCB Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentrations (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit In Background Samples (2)
1,2-Dichlorobenzene	1	54J	11	22	ND
Fluorene	2	57J-69J	25	31	23
Di-n-Butylphthalate	3	380B-1095B	435	421	86
Butylbenzylphthalate	1	59J	12	24	ND
Bis(2-ethylhexyl)phthalate	5	47J-4500	1787	1884	52
Di-N-Octyl Phthalate	1	1300	260	520	ND
Pesticides					
Heptachlor Epoxide	1	680**	136	272	ND
Mirex	1	12000**	2400	4800	ND

(1) Out of total 5 samples
(2) Units ug/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
J Estimated value
B Found in laboratory blank, possible/probable contamination
ND Not detected
** Analyzed at medium concentrations

TABLE 3-6
(con't)

SUMMARY LIST OF INORGANIC PARAMETERS IDENTIFIED IN ONSITE SOILS (4 - 6 FT.) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Inorganic Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentrations (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit in Background (2)
Antimony	1	[16]J,R	3	6	4
Chromium	5	11-115	35	40	18
Copper	5	29-43	34	5	29
Iron	5	24700-50800	34060	8933	29572
Magnesium	5	[1260]-6020	2954	1636	2782
Mercury	2	0.19-0.25	0.088	0.109	0.098
Nickel	5	[15]-40	25	9	19
Sodium	1	[680]	136	272	143
Zinc	5	51-359	129	116	113

(1) Out of total 5 samples

(2) Units mg/kg dry weight

(3) Mean calculated using zero for samples where parameters not detected

R Spike recovery not within control limits

[ ] Positive values less than the contract required detection limit

J Estimtaed value

TABLE 3-6
(con't)

SUMMARY LIST OF VOLATILE PARAMETERS IDENTIFIED IN ONSITE SOILS (4 - 6 FT.) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Volatile Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentrations (2)(3)	Standard Deviation (2)	Upper 95% Confidence Level In Background Samples (2)
Methylene Chloride	1	1700J,B	340	680	ND
Acetone	3	100B-48000B,J	9644	19178	ND
1,2-Dichloroethane	1	8900J	1780	3560	ND
2-Butanone	1	190000B,J	38000	76000	ND
1,1,1-Trichloroethane	2	5-2800J	561	1120	ND
Trichloroethene	2	4J-1100J	221	440	ND
Benzene	4	4J-31	15	13	ND
Toluene	5	36-26000J	5270	10365	13
Chlorobenzene	1	4J	1	2	ND
Ethylbenzene	5	4J-41000J	8206	16397	ND
Total Xylenes	5	11-240000J	48036	95982	2

(1) Out of total 5 samples
(2) Units ug/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
J Estimated value
B Found in laboratory blank, indicates possible/probable contamination
ND Not detected

TABLE 3-7

SUMMARY LIST OF VOLATILE PARAMETERS IDENTIFIED
IN ONSITE SOILS (6-8 FT.) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Volatile Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentrations (2)(3)	Standard Deviation (2)	Upper 95% Confidence Level in Background Samples(2)
Methylene Chloride	8	190J,**-6000B,J,**	814	1766	ND
Acetone	10	130B-42000B,**	5272	11024	ND
Carbon Disulfide	10	3J-10	2	3	ND
1,1-Dichloroethene	5	3J-7600J,**	293	1461	ND
1,1-Dichloroethane	10	3J-41000**	2104	8169	ND
Trans-1,2-Dichloroethene	5	3J-7100	482	1682	ND
1,2-Dichloroethane	9	14-68000**	5887	17558	ND
2-Butanone	7	180J,B,**-40000B,**	5368	11033	ND
1,1,1-Trichloroethane	15	4J-230000**	10252	44102	ND
Trichloroethene	20	4J-430000**	21525	83962	ND
Benzene	19	4J-110	19	23	ND
4-Methyl-2-Pentanone	8	4J-6400J,**	354	1301	ND
Tetrachloroethene	6	3J-2500J,**	193	639	ND
Toluene	26	17-140000**	9818	28420	13
Chlorobenzene	5	5-5200**	203	999	ND
Ethylbenzene	24	3J-76000J,**	9789	20794	ND
Total Xylenes	26	9-270000**	39927	84355	2

(1) Out of total 26 samples

(2) Units ug/kg dry weight

(3) Mean calculated using zero for samples where parameters not detected

J Estimated value

B Found in laboratory blank, indicates possible/probable contamination

** Analyzed at medium concentration

ND Not detected

TABLE 3-7
(con't)

SUMMARY LIST OF BNA AND PESTICIDE/PCB PARAMETERS IDENTIFIED IN ONSITE SOILS (6 - 8 FT.) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

BNA and PCB Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentrations (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit in Background Samples (2)
Phenol	2	87J-740	32	143	ND
1,4-Dichlorobenzene	2	240J-2300J,**	9	46	ND
1,2-Dichlorobenzene	4	49J-17000**	748	3266	ND
Isophorone	2	44J-720	29	138	ND
1,2,4-Trichlorobenzene	2	100J-210J	12	44	ND
Naphthalene	24	79J-7800**	1802	2101	1438
2-Methylnapthalene	25	130J-6800**	1639	1604	1587
Fluorene	11	63J-380	83	125	23
Hexachlorobenzene	3	960-34000**	1445	6532	61
Phenanthrene	25	110J-4700J,**	1122	1214	1091
Di-N-Butylphthalate	16	100J,B-2400J,**	357	586	86
Butylbenzylphthalate	4	450J-4900J,**	383	1133	ND
Bis(2-ethylhexyl)Phthalate	26	71J-370000**	28086	76468	52
Di-N-Octyl Phthalate	12	44J-22000**	1307	4272	ND
Indeno(1,2,3-cd)pyrene	5	54J-2900J,**	134	558	150
Dibenz(a,h)Anthracene	3	66J-2700J,**	122	522	31
Benzo(g,h,i)Perylene	14	53J-4500J**	255	855	135
Pesticides					
4,4'-DDT	2	27-36	2	8	ND
PCB's(4)	7	990-37000**	2230	7245	ND

(1) Out of total 26 samples
(2) Units ug/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
(4) Arochlor 1232, 1242, 1248, 1254
J Estimated value
** Analyzed at medium concentration
B Found in laboratory blank, possible/probable contamination
ND Not detected

TABLE 3-7
(con't)

SUMMARY LIST OF INORGANIC PARAMETERS IDENTIFIED IN ONSITE SOILS (6 - 8 FT.) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Inorganic Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentrations (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit In Background (2)
Arsenic	26	9.3J-29J	19	5	19
Barium	26	[35]-253	81	50	100
Beryllium	26	[0.45]-[1.8]	0.54	0.35	0.726
Chromium	26	8.8-29	17	4	18
Cobalt	26	[7]-51	15	8	13
Copper	26	19-66	30	9	29
Iron	26	20800-48900	32462	7310	29572
Magnesium	26	[1340]-5140	3233	1060	2782
Nickel	26	[14]-47	29	9	19
Potassium	26	[1220]-3450	1730	494	2161
Zinc	26	41-195	90	35	113

(1) Out of total 26 samples

(2) Units mg/kg dry weight

(3) Mean calculated using zero for samples where parameters not detected

R Spike recovery not within control limits

[ ] Positive values less than the contract required detection limit

S Value determined by standard addition

J Estimated value

TABLE 3-8

SUMMARY OF ORGANIC PARAMETERS IDENTIFIED IN
CEMENT PLANT SURFACE SOILS THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Parameters Soil	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentration (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit in Onsite Soil	Upper 95% Confidence Limit in Background
Volatiles						
Methylene Chloride	6	2J-18	3	5	1007	ND
1,2-Dichloroethane	2	4J-16	1	4	6750	ND
BNA and PCB						
Naphthalene	7	229J-36000**	3628	9476	3453	1438
2-Methylnaphthalene	11	90J-55000**	5353	14471	2719	1587
Dibenzofuran	4	57J-12000**	1069	3174	96	349
Flourene	1	100J	8	27	146	23
Phenanthrene	7	136J-30000**	3338	8029	1660	1091
Anthracene	2	2500J,**-5500J,**	615	1559	659	69
Di-N-Butylphthalate	10	82J-1677B	425	469	2324	86
Fluoranthene	5	130J-20000**	2689	6217	300	594
Pyrene	5	130J-20000**	2455	5837	280	512
Benzo(a)Anthracene	4	190J-16000**	1787	4468	187	346
Bis(2-ethylhexyl)Phthalate	2	330J-469J	61	147	218378	52
Chrysene	5	72J-16000**	1999	4715	227	423
Benzo(b)fluoranthene	4	250J-21000**	2511	6078	160	598
Benzo(k)fluoranthene	4	250J-21000**	2511	6078	82	598
Benzo(a)pyrene	4	150J-10000**	1258	2981	116	301
Indeno (1,2,3-cd)Pyrene	1	5200J,**	400	1386	32	150
Benzo(g,h,i)Perylene	1	3900J,**	300	1039	175	135
PCB's	6	398-3100	887	1234	38305	ND

(1) Out of a total of 13 samples
(2) ug/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
J Estimated value
B Found in laboratory blank
** Analyzed at medium concentration.

TABLE 3-8
(con't)

SUMMARY OF INORGANIC PARAMETERS IDENTIFIED IN CEMENT PLANT SURFACE SOILS THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentration (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit In Onsite Soil (2)	Upper 95% Confidence Limit In Background Soil(2)
Arsenic	12	8.7-78	21	19	19	19
Barium	13	[51]-578	166	154	118	100
Calcium	13	[982]-11400	19867	29892	11331	7316
Copper	13	[17]-119	36	25	44	29
Iron	13	6620-51700	32186	12702	44152	29572
Mercury	6	0.1-0.52	0.13	0.16	0.217	0.098
Nickel	12	[14]-36	25	10	29	19
Sodium	5	[766]-[5090]	676	1343	222	143

(1) Out of a total of 13 samples

(2) mg/kg dry weight

(3) Mean calculated using zero for samples where parameters not detected

[] Positive values less than the contract required detection limit

J Estimated value

E Estimated due to interference

R Spike recovery not within control limits

TABLE 3-9

SUMMARY OF ORGANIC PARAMETERS IDENTIFIED IN
CEMENT PLANT SUBSURFACE SOILS (2 - 6 FEET) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentration (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit In Onsite Soil (2)	Upper 95% Confidence Limit In Background Soil(2)
Volatiles						
Methylene Chloride	3	2J-97	20	38	907	ND
BNA & PCB						
Isophorone	1	448	90	179	246	ND
Di-N-Butylphthalate	5	303J,B-13138	743	349	2324	86
Butylbenzylphthalate	1	68J	14	27	1111	ND
Bis(2-ethylhexyl)phthalate	1	59J	12	24	218378	52
PCB	5	170-1240	628	483	38305	ND

(1) Out of a total of 5 samples
(2) ug/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
J Estimated value
B Found in laboratory blank

TABLE 3-9
(con't).

SUMMARY OF INORGANIC PARAMETERS IDENTIFIED IN
CEMENT PLANT SUBSURFACE SOILS (2 - 6 FEET) THAT EXCEED BACKGROUND
SUMMIT NATIONAL SITE

Parameters	Number of Times Detected (1)	Range of Detected Concentrations (2)	Mean Concentration (2)(3)	Standard Deviation (2)	Upper 95% Confidence Limit in Onsite Soil (2)	Upper 95% Confidence Limit in Background Soil(2)
Cobalt	5	[14]-[23]	17	3	13	13
Copper	5	26-30	28	1	44	29
Magnesium	5	[2520]-4890	3608	852	3168	2782
Nickel	5	[22]-40	32	6	29	19

(1) Out of a total of 5 samples
(2) mg/kg dry weight
(3) Mean calculated using zero for sample where parameters not detected
[ ] Positive values less than the contract required detection limit
E Estimated due to interference

TABLE 3-10

SUMMARY LIST OF ORGANIC PARAMETERS IDENTIFIED IN EASTERN PERIMETER SOILS THAT EXCEED BACKGROUND (2)
SUMMIT NATIONAL SITE

Parameters	Eastern Perimeter Soils		Mean Concentration(3)	Standard Deviation	Upper 95% Confidence Limit in Onsite Surface Soils	Upper 95% Confidence Limit in Background Soils
	No. of Times Detected (1)	Range of Detected Concentration				
Volatiles						
Toluene	7	4J-28	11	9	15658	13
BNA Parameters						
Benzoic Acid	1	500J	56	157	699	297
Naphthalene	7	125J-2000	872	766	3453	1438
2-Methylnaphthalene	7	125J-3200	1329	1187	2719	1587
Acenapthene	1	240J	27	75	133	35
Dibenzofuran	5	120J-870	260	310	96	349
Fluorene	1	480	53	151	146	23
Phenanthene	7	204J-6500	1334	1924	1660	1091
Anthracene	1	910	101	286	659	69
Di-n-butylphthalate	7	60J-10868	279	364	2324	86
Fluoranthene	5	86J-7100	947	2192	300	594
Pyrene	6	130J-4700	685	1434	280	512
Butylbenzylphthalate	1	67J	7	21	1111	ND
Benzo(a)Anthracene	4	88J-3000	429	931	187	346
Bis(2-ethylhexyl)Phthalate	4	45J-206J	54	72	218378	52
Chrysene	4	83J-2400	315	741	227	423
Benzo(b)Fluoranthene	4	120J-3200	462	992	160	598
Benzo(k)Fluoranthene	4	120J-3200	462	992	82	598
Benzo(a)Pyrene	3	41J-1700	238	531	116	301
Indeno(1,2,3-cd)Pyrene	3	41J-1700	238	531	32	150
Dibenz(a,h)Anthracene	2	89J-410	55	128	ND	31
Benzo(g,h,i)Perylene	4	120J-1200	194	368	175	135
PCB's	2	450-540	110	207	38305	ND

Notes:

(1) Out of a total of 9 samples
(2) ug/kg dry weight
(3) Mean calculated using zero for those samples where parameters were not detected
J Estimated value
B Found in laboratory blank

TABLE 3-10
(con't)

SUMMARY LIST OF INORGANIC PARAMETERS IDENTIFIED IN
EASTERN PERIMETER SOILS THAT EXCEED BACKGROUND (2)
SUMMIT NATIONAL SITE

Parameters	Eastern Perimeter Soils No. of Times Detected (1)	Range of Detected Concentration	Mean Concentration(3)	Standard Deviation	Upper 95% Confidence Limit in Onsite Surface Soils	Upper 95% Confidence Limit in Background Soils
Aluminum	9	2300-12700	8169	2627	9640	11699
Arsenic	9	9.9-20	13	3	19	19
Barium	9	[53]-295	134	73	118	100
Beryllium	7	[.52]-1.3	.529	.366	0.729	0.726
Cadmium	4	[2.8]-4.2	2	2	6	3
Calcium	9	[402]-19700	4706	5883	11331	7316
Chromium	9	15-22	18	3	32	18
Cobalt	9	[5]-[15]	11	3	13	13
Copper	9	29-56	36	7	44	29
Iron	9	26100-40600	30211	4452	44152	29572
Lead	9	17-241	99	85	49	117
Magnesium	9	[515]-4700	2742	1126	3168	2782
Manganese	9	54J-1350J	512	394	452	1003
Mercury	5	.2-1.1	.272	.347	0.217	0.098
Nickel	9	[18]-30	24	5	29	19
Potassium	9	[1190]-[2230]	1826	323	1923	2161
Selenium	1	3.3	0	1	0	ND
Silver	4	[2.7]J,R-[4.5]J,R	2	2	1	5
Sodium	6	[674]-[1150]	581	438	222	143
Tin	2	[16]-[22]	4	8	7	ND
Vanadium	9	[16]-[25]	20	3	31	26
Zinc	9	36-380	155	114	205	113

Notes:

(1) Out of a total of 9 samples
(2) mg/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
[ ] Positive values less than the contract required detection limit
R Spike recovery not within control limits
S Value determined by standard addition
J Estimated value

TABLE 3-11

SUMMARY LIST OF ORGANIC PARAMETERS IDENTIFIED IN ONSITE SURFACE WATER
SUMMIT NATIONAL SITE[a]

Parameters	No. of Times Detected[b]	Range of Detected Concentrations	Mean Concentration[c]	Standard Deviation	Upper 95% Confidence Limit
Volatiles					
Methylene Chloride	4	2B,J-51	9	19	28
Acetone	6	30B,J-4000	1324	1857	3273
1,1-Dichloroethane	2	3J	1	1	2
1,2-Dichloroethane	4	3B-860	295	389	704
2-Butanone	3	11B-16B	--	--	--
1,1,1-Trichloroethane	3	5-66	13	24	38
4-Methyl-2-pentanone	1	78	NA	NA	NA
Tetrachloroethene	1	24	NA	NA	NA
Toluene	3	1J-120	21	45	67
Chlorobenzene	1	59	NA	NA	NA
Total Xylenes	3	1J-100	17	37	56
BNAs					
Phenol	2	8J-12	3	5	8
Aniline	2	227-231	76	108	190
1,4-Dichlorobenzene	1	49J	NA	NA	NA
1,2-Dichlorobenzene	1	24J	NA	NA	NA
Hexachloroethane	1	14J	NA	NA	NA
Isophorone	2	12-13	4	6	10
Benzoic Acid	1	47J	NA	NA	NA
Bis(2-ethylhexyl)Phthalate	6	7B,J-25B	--	--	--
Benzo(b)Fluoranthene	1	3J	NA	1	NA
Benzo(k)Fluoranthene	1	3J	NA	1	NA
Benzo(a)Pyrene	1	4J	NA	1	NA
Indeno(1,2,3-cd)Pyrene	1	3J	NA	1	NA
Dibenz(a,h)Anthracene	1	3J	NA	1	NA
Benzo(g,h,i)Perylene	1	3J	NA	1	NA

Pesticides/PCB's

None Detected

Notes

a All values expressed in parts per billion (ppb) unless otherwise noted
b Based on total of six samples
c Mean is calculated using zero for samples where parameters not detected
B Analyte found in laboratory blank as well; indicates possible/probable laboratory contamination
J Estimated value
-- All values show laboratory contamination and statistically treated as zero
NA Not applicable; only one value

TABLE 3-11
(con't)

SUMMARY LIST OF INORGANIC AND SAS PARAMETERS IDENTIFIED IN ONSITE SURFACE WATER[a]
SUMMIT NATIONAL SITE

Parameters	No. of Times Detected[b]	Range of Detected Concentrations	Mean Concentration[c]	Standard Deviation	Upper 95% Confidence Limit	Area 4 USGS (1981)
Inorganic Parameters						
Aluminum	5	200-39800	9932	14746	25409	NA
Antimony	2	62-121	31	46	79	NA
Arsenic	2	25-27	9	12	22	NA
Barium	3	9.9-25	10	11	21	NA
Beryllium	2	5-7.9	2	3	5	NA
Cadmium	3	9-35	11	13	25	NA
Calcium	6	139000-297000E	216283	63373	282800	NA
Chromium	3	4.2-28	9	11	21	NA
Cobalt	4	13-123	37	45	84	NA
Copper	4	11-122	41	51	94	NA
Iron	6	3030-68500	23332	26386	51026	0-27000
Magnesium	6	32500-120000	77647	34140	113480	NA
Manganese	6	3740-8100	6380	1681	8145	0-4900
Nickel	6	20-322	112	114	232	NA
Potassium	6	3670-12400	8155	3308	11627	NA
Selenium	1	16	--	--	--	NA
Sodium	6	14700-72100	44833	23674	69682	NA
Zinc	6	202-1660	749	630	1411	NA
SAS Parameters						
Ammonia as N (mg/l)	2	4.5-4.6	3	2	8	NA
Chloride (mg/l)	3	47-123	85	31	162	NA
Suspended Solids (mg/l)	3	7-41	18	16	58	NA
Dissolved Solids (mg/l)	3	1320-2210	1873	394	2853	NA
Sulfate (mg/l)	3	850-1330	1160	220	1705	1.0-2500
Acidity (mg/l)	3	43-320	137	130	459	NA
Field Parameters						
pH (standard units)	6	3.4-6.5	--	--	--	3.3-9.2
Specific Conductance (umhos/cm)	6	1050-2000	1463	398	2163	30-14500

Notes:

[a] All values expressed in parts per billion (ppb) unless otherwise noted
[b] Based on total of six samples except for SAS parameters which were analyzed in three samples
[c] Mean is calculated using zero for samples where parameters not detected
E Value is estimated due to interference
NA Not available
-- Not applicable

TABLE 3-12

SUMMARY LIST OF ORGANIC PARAMETERS IDENTIFIED
IN OFFSITE SURFACE WATER THAT EXCEED BACKGROUND (1) (2)
SUMMIT NATIONAL SITE

Parameters	Concentration in South Ditch-Upstream	Concentration in South Ditch-Downstream*	Concentration in Lower East Drainage Ditch	Concentration in East Drainage Ditch(3)	Concentration in First Impoundment(3)	Concentration in Second Impoundment	Range of Concentration Detected in Onsite Surface Water
Volatiles							
Vinyl Chloride	ND	7J	ND	ND	ND	ND	ND
Methylene Chloride	1J,B	25B	ND	15	ND	2J,B	2B,J-51 •
Acetone	17B	15B,J	3100	13	ND	18B	30B,J-4000 •
1,1-Dichloroethane	ND	34	ND	ND	ND	ND	3J •
Trans-1,2-dichloroethene	ND	7B	5	ND	ND	ND	ND •
1,2-Dichloroethane	ND	7B	500	ND	16	11	3B-860•
2-Butanone	19B	13B	15B	ND	ND	18B	--•
1,1,1-Trichloroethane	ND	29	ND	ND	ND	ND	5-66
Trichloroethene	ND	6	ND	ND	ND	ND	ND•
4-Methyl-2-pentanone	ND	ND	58	ND	ND	ND	7B[a]•
Toluene	ND	ND	ND	ND	ND	13	1J-120
Chlorobenzene	ND	25	ND	ND	ND	ND	59[a]
BNAs							
Phenol	ND	107	7J	ND	ND	ND	8J-12
Aniline	ND	ND	283	ND	ND	ND	227-231
Isophorone	ND	ND	14	ND	ND	ND	12-13
Benzoic Acid	ND	ND	31J	ND	ND	ND	47J[a]
Bis(2-ethylhexyl) Phthalate	6J,B	12B,J	14B,J	25B	13B	10B	--

Notes:

(1) Maximum concentration in particular area
(2) Units in ppb
(3) 1984 sample only - dry in 1986
B Analyte found in laboratory blank as well; indicates possible/probable laboratory contamination
J Estimated value
• 1986 sample - represents low flow or worst case
ND Not detected
-- All values show laboratory contamination and statistically treated as zero
[a] Only one sample

TABLE 3-12
(con't)

SUMMARY LIST OF INORGANIC AND SAS PARAMETERS IDENTIFIED IN OFFSITE SURFACE WATER THAT EXCEED BACKGROUND (1) (2)
SUMMIT NATIONAL SITE

Inorganic Parameters	Concentration in South Ditch-Upstream	Concentration in South Ditch-Downstream*	Concentration in Lower East Drainage Ditch	Concentration in East Drainage Ditch(3)	Concentration in First Impoundment(3)	Concentration in Second Impoundment	Range of Concentration Detected in Onsite Surface Water	Area 4 USGS (1981)
Aluminum	343ND	570	10400	2015ND	ND	243	200-39800	NA
Antimony	ND	ND	94	178	ND	ND	62-121	NA
Arsenic	ND	ND	38+,S	ND	ND	ND	25-27	NA
Barium	[76]	ND	220	ND	ND	[12]	9.9-25	NA
Cadmium	ND	ND	9	6	ND	5	9-35	NA
Calcium	386000E	383000E	364000E	206600	105700	237300	139000-297000E	NA
Chromium	11	ND	22	ND	ND	ND	4.2-28	NA
Cobalt	[8.7]	[23]	[15]	173	ND	ND	13-123	NA
Copper	[16]	[10]	28	70	100	[9.4]	11-122	NA
Iron	17200	8520	131000	17560	1500	21100	3030-68500	27000
Magnesium	112000	92900	130000	67700	32510	68810	32500-120000	NA
Manganese	5170	3670	8000	19000	900	4700	3740-8100	4900
Nickel	[9.9]	62	46	172	ND	ND	20-322	NA
Potassium	20400	9700	11700	4510	4040	18900	3670-12400	NA
Sodium	130000	142000	312000	37300	34400	64200	14700-72100	NA
Vanadium	[5.6]	ND	[8.3]	ND	ND	ND	ND	NA
Zinc	155	40	320	930	104	75	202-1660	NA
SAS Parameters								
Total Alkalinity ($CaCO_3$)	287	195	343	--	--	48	ND	NA
Ammonia as N (mg/l)	2.3	2.6	13	--	--	0.9	4.5-4.6	NA
Chloride (mg/l)	293	144	242	--	--	79	47-123	NA
Suspended Solids (mg/l)	486	33	456	--	--	21	7-41	NA
Dissolved Solids (mg/l)	2410	2320	2900	--	--	1060	1320-2210	NA
Sulfate (mg/l)	1270	1200	1490	--	--	536	850-1330	2500
Field Parameters								
pH (standard units)	6.0	6.5	6.0	3.0	5.6	5.5	NA	3.3-9.2
Sp. Cond. (umhos/cm)	2400	1335	3000	1640	940	1210	1050-2000	14500

Notes:

(1) Maximum concentration in particular area
(2) Units in ppb unless otherwise noted
(3) 1984 sample only - dry in 1986
[ ] Positive values less than the contract required detection limit
E Value is estimated due to interference
NA Not available
+ Correlation coefficient for method of standard addition is less than 0.995
S Value is determined by standard addition
* 1986 sample - represents low flow or worst case
ND Not detected
-- Not analyzed

TABLE 3-13

SUMMARY LIST OF VOLATILE PARAMETERS IDENTIFIED IN WEST POND SEDIMENT THAT EXCEEDED BACKGROUND SOILS
SUMMIT NATIONAL SITE

Volatile Parameters	Number of Times Detected(1)	Range of Detected Concentrations(2)	Mean Concentrations(2)(3)	Standard Deviation	Upper 95% Confidence Limit in Onsite Surface Soils(2)	Upper 95% Confidence Limit in Background Soil Samples(2)	Maximum Concentration in Upstream Sediment(2)
Methylene Chloride	6	50-41000**	6263	12574	1007	ND	230
Acetone	2	300A-2600**	322	811	26222	ND	ND
1,1-Dichloroethene	3	13-16	5	7	2	ND	ND
1,1-Dichloroethane	1	86	10	27	2	ND	ND
Trans-1,2-Dichloroethene	1	9A	1	3	22	ND	ND
1,2-Dichloroethane	8	3J-8900**	2426	3408	6750	ND	ND
2-Butanone	3	12000**-18000**	5000	7211	3429	ND	508J
1,1,1-Trichloroethane	7	50A-2500A,**	670	747	4499	ND	ND
Trichloroethene	3	10-500**	58	156	15782	ND	ND
Toluene	4	12A-174000**	23335	53791	15658	13	ND
Chlorobenzene	4	8J-1000**	183	345	177	ND	ND
Ethylbenzene	6	16A-28000**	8037	10817	11189	ND	ND
Total Xylenes	5	4J-92000**	29023	39332	44161	2	ND

(1) Out of total 9 samples
(2) Units ug/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
J Estimated value
B Found in laboratory blank, indicates possible/probable contamination
** Analyzed at medium concentration
ND Not detected
A Detected below quantitation limit

TABLE 3-13
(con't)

SUMMARY LIST OF BNA AND PCB PARAMETERS IDENTIFIED IN WEST POND SEDIMENT THAT EXCEEDED BACKGROUND SOILS SUMMIT NATIONAL SITE

BNA and PCB Parameters	Number of Times Detected(1)	Range of Detected Concentrations(2)	Mean Concentrations(2)(3)	Standard Deviation	Upper 95% Confidence Limit in Onsite Surface Soils(2)	Upper 95% Confidence Limit in Background Soil Samples(2)	Maximum Concentration in Upstream Sediment(2)
N-Nitrosodiphenylamine	2	8262J-11546J	2201	4190	149	ND	409J
Hexachlorobenzene	2	2400-2700A	567	1062	18438	61	518J
Bis(2-ethylhexyl)Phthalate	9	5128J-87000	36707	26376	218378	52	197J
Di-n-Octyl Phthalate	3	2300-9400	1933	3206	15056	ND	ND
PCBs (4)	5	1100A-35000C	6022	10597	38305	ND	ND

(1) Out of total 9 samples

(2) Units ug/kg dry weight

(3) Mean calculated using zero for samples where parameters not detected

(4) Arochlor 1232, 1242, 1248, 1254

J Estimated value

A Detected below quantitation limit

ND Not detected

C Pesticide parameter confirmed by GC/MS

TABLE 3-13
(con't)

SUMMARY LIST OF INORGANIC PARAMETERS IDENTIFIED
IN WEST POND SEDIMENTS THAT EXCEEDED BACKGROUND SOILS
SUMMIT NATIONAL SITE

Inorganic Parameters	Number of Times Detected(1)	Range of Detected Concentrations(2)	Mean Concentrations(2)(3)	Standard Deviation	Upper 95% Confidence Limit In Onsite Surface Soils(2)	Upper 95% Confidence Limit In Background Soil Samples(2)	Maximum Concentration In Upstream Sediment(2)
Antimony	1	148R	16	47	35	4	ND
Chromium	9	15R-55R	32	14	32	18	10
Copper	9	18R-57	37	13	44	29	[17]
Iron	9	34354-72667	47789	11250	44152	29572	25682
Cyanide	4	2.1R-25R	4	8	7	1.186	ND
Mercury	4	.16-.3	.094	.111	0.217	0.098	ND
Nickel	9	[15]-37A	23	6	29	19	30R
Sodium	4	[793]-[1310]	482	556	222	143	ND
Vanadium	9	[14]-[35]R	24	7	31	26	[24]R
Zinc	9	71R,E-915R,E	263	259	205	113	85R,E

(1) Out of total 9 samples

(2) Units mg/kg dry weight

(3) Mean calculated using zero for samples where parameters not detected

[ ] Positive values less than the contract required detection limit

R Spike sample recovery is not within control limits

E Estimated due to presence of interference

TABLE 3-14

SUMMARY LIST OF VOLATILE PARAMETERS IDENTIFIED IN EAST POND SEDIMENT THAT EXCEEDED BACKGROUND SOILS

SUMMIT NATIONAL SITE

Volatile Parameters	Number of Times Detected(1)	Range of Detected Concentrations(2)	Mean Concentrations(2)(3)	Standard Deviation	Upper 95% Confidence Limit In Onsite Surface Soils(2)	Upper 95% Confidence Limit In Background Soil Samples(2)	Maximum Concentration In Upstream Sediment(2)
Methylene Chloride	6	8J,B-8708	314	310	1007	ND	230
Acetone	5	468-510A	180	199	26222	ND	ND
1,1-Dichloroethane	3	69-2261	534	854	2	ND	ND
1,2-Dichloroethane	2	13115-16608	4246	6778	6750	ND	ND
1,1,1-Trichloroethane	4	30.5A-787	243	343	4499	ND	508J
Trichloroethene	2	10-20	4	7	15782	ND	ND
Benzene	2	10J-25	5	9	4	ND	ND
Chlorobenzene	4	20A-329	95	117	177	ND	ND
Ethylbenzene	3	24A-146	35	32	11189	ND	ND
Total Xylenes	2	43-67	16	26	46161	2	ND

(1) Out of total 7 samples

(2) Units ug/kg dry weight

(3) Mean calculated using zero for sample where parameters not identified

J Estimated value

B Found in laboratory blank, indicates possible/probable contamination

ND Not detected

A Detected below quantitation limit

TABLE 3-14
(con't)

SUMMARY LIST OF BNA AND PCB PARAMETERS IDENTIFIED IN EAST POND SEDIMENT THAT EXCEEDED BACKGROUND SOILS
SUMMIT NATIONAL SITE

Semi-Volatile Parameters and PCBs	Number of Times Detected(1)	Range of Detected Concentrations(2)	Mean Concentrations(2)(3)	Standard Deviation	Upper 95% Confidence Limit In Onsite Surface Soils(2)	Upper 95% Confidence Limit In Background Soil Samples(2)	Maximum Concentration in Upstream Sediment(2)
N-Nitrosodiphenylamine	3	490J-22951J	3505	7948	149	ND	409J
Hexachlorobenzene	2	518J-1080A	228	391	18438	61	518J
Di-n-butylphthalate	2	25218-67148	1319	2368	2324	86	23488
Bis(2-ethylhexyl)Phthalate	7	9244-291808	70076	95172	218378	52	197J
Di-n-Octyl Phthalate	5	339J-55378J	11111	18792	15056	ND	ND
PCBs (4)	3	8171-21000	4748	7236	38305	ND	ND

(1) Out of total 7 samples
(2) Units ug/kg dry weight
(3) Mean calculated using zero for samples where parameters not detected
(4) Arochlor 1232, 1242, 1248, 1254
J Estimated value
B Found in laboratory blank, indicates possible/probable contamination
ND Not detected
A Detected below quantitation limit
B Found in laboratory blank, indicates possible/probable contamination

TABLE 3-14
(con't)

SUMMARY LIST OF INORGANIC PARAMETERS IDENTIFIED IN EAST POND SEDIMENT THAT EXCEEDED BACKGROUND SOILS
SUMMIT NATIONAL SITE

Inorganic Parameters	Number of Times Detected(1)	Range of Detected Concentrations(2)	Mean Concentrations(2)(3)	Standard Deviation	Upper 95% Confidence Limit in Onsite Surface Soils(2)	Upper 95% Confidence Limit in Background Soil Samples(2)	Maximum Concentration in Upstream Sediment(2)
Antimony	2	68-[85]R	22	35	35	4	ND
Barium	7	[82]R-[151]	106	25	118	100	[128]
Chromium	7	12R-73	44	18	32	18	10
Iron	7	30728-118000	57806	38168	44152	29572	25682
Cyanide	2	3R-74R	11	26	7	1.186	ND
Mercury	4	.17-.29	0.13	.119	0.217	0.098	ND
Nickel	6	[21]R-[38]	24	11	29	19	30R
Sodium	2	[1870]-[1960]	547	865	222	143	ND
Zinc	7	100R,E-1570	471	470	205	113	85R,E

(1) Out of total 7 samples

(2) Units mg/kg dry weight

(3) Mean calculated using zero for samples where parameters not detected

R Spike recovery not within control limits

[ ] Positive values less than the contract required detection limit

E Value is estimated due to the presence of interference

TABLE 3-15

SUMMARY LIST OF VOLATILE PARAMETERS IDENTIFIED IN OFFSITE SEDIMENTS THAT EXCEED BACKGROUND (1) (2)

SUMMIT NATIONAL SITE

Volatile Parameters	Concentration In South Ditch-Upstream	Concentration In South Ditch-Downstream	Concentration In Lower East Drainage Ditch	Concentration In East Drainage Ditch	Concentration In First Impoundment	Concentration In Second Impoundment	Maximum Concentration In Upstream Sediment (2)	Upper 95% Confidence Limit In Background Soil Samples (2)
Methylene Chloride	340	400	2788	670	--	--	230	ND
Acetone	229	ND	ND	64B	1400	15J	ND	ND
Trans-1,2-Dichloroethene	ND	290	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	240	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	863J	ND	ND	ND	27	423	508J	ND
Trichloroethene	ND	110A	ND	ND	ND	ND	ND	ND
Benzene	ND	33A	ND	ND	ND	ND	ND	ND
Toluene	97	ND	ND	ND	ND	ND	ND	13
Total Volatiles(3)	1229	780	375	670	1600	160	514	NA

(1) Maximum concentrations in particular area
(2) Units ug/kg dry weight
(3) Based on highest single sample in particular area
J Estimated value
A Detected below quantitation limit
B Found in laboratory blank, indicates possible/probable contamination
ND Not detected
NA Not applicable
-- Detected below background

TABLE 3-15
(con't)

SUMMARY LIST OF BNA AND PESTICIDE/PCB PARAMETERS IDENTIFIED IN OFFSITE SEDIMENTS THAT EXCEED BACKGROUND (1) (2)
SUMMIT NATIONAL SITE

Semi-Volatile Parameters	Concentration in South Ditch Upstream	Concentration in South Ditch-Downstream	Concentration in Lower East Drainage Ditch	Concentration in East Drainage Ditch	Concentration in First Impoundment	Concentration in Second Impoundment	Maximum Concentration in Upstream Sediment	Upper 95% Confidence Limit in Background Soil Samples (2)
Phenol	558J	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	680A	ND	ND	ND	ND	ND	ND
4-Methylphenol	997J	ND	ND	ND	ND	ND	ND	ND
Naphthalene	1600	800A	ND	ND	2100	470A	ND	1438
2-Methylnapthalene	630A	1200A	ND	430A	2400A	580A	ND	1587
Acenapthylene	1100A	ND	ND	ND	ND	ND	ND	ND
Acenapthene	1300A	ND	ND	ND	ND	ND	ND	35
Dibenzofuran	2100A	183J	ND	ND	370A	ND	ND	349
Fluorene	3100	ND	ND	ND	ND	ND	ND	23
N-Nitrosodiphenylamine	809J	ND	ND	ND	1727J	809J	409J	ND
Hexachlorobenzene	ND	ND	ND	ND	ND	2800	518J	61
Phenanthene	6400	710A	ND	ND	1700A	470A	ND	1091
Di-N-Butylphthalate	5121J	ND	73368	--	86368	43138	23488	86
Fluoranthene	24000	ND	ND	670	309J	ND	ND	594
Pyrene	16000	ND	ND	640A	359J	ND	ND	512
Benzo(a)Anthracene	9000	ND	ND	ND	ND	ND	ND	346
Bis(2-ethylhexyl) Phthalate	704J	15000	26000	ND	5909J	9978,J	197J	52
Chrysene	16000	590A	ND	ND	ND	ND	ND	423
Benzo(b)Fluoranthene	13000	ND	ND	640A	ND	ND	ND	598
Benzo(k)Fluoranthene	413J	ND	ND	ND	ND	ND	ND	598
Benzo(a)Pyrene	7300	ND	ND	ND	ND	ND	ND	301
Indeno(1,2,3-cd) Pyrene	5200	ND	ND	ND	ND	ND	ND	150
Dibenz(a,h)Anthracene	5400	ND	ND	ND	ND	ND	ND	31
Benzo(g,h,i)Perylene	6900	ND	ND	ND	ND	ND	ND	135
Pesticides								
Heptachlor Epoxide	ND	ND	ND	ND	8.1	ND	ND	ND
PCBs (4)	ND	4200A	ND	ND	ND	ND	ND	ND
Total BNAs (3):	124530	15480	26000	2340	20517	26800	3128	NA

(1) Maximum concentrations in particular area
(2) Units ug/kg dry weight
(3) Based on highest single sample in particular area
(4) Arochlor 1232, 1242, 1248, 1254
J Estimated value
B Found in laboratory blank, possible/probable contamination
ND Not deter[illegible]
A Detected [illegible] quantitation limit
Detected [illegible] background

TABLE 3-15
(con't)

SUMMARY LIST OF INORGANIC PARAMETERS IDENTIFIED IN OFFSITE SEDIMENTS THAT EXCEED BACKGROUND (1) (2)
SUMMIT NATIONAL SITE

Inorganic Parameters	Concentration in South Ditch-Upstream	Concentration in South Ditch-Downstream	Concentration in Lower East Drainage Ditch	Concentration in East Drainage Ditch	Concentration in First Impoundment	Concentration in Second Impoundment	Maximum Concentration in Upstream Sediment	Upper 95% Confidence Limit in Background Soil Samples (2)
Aluminum	13800	17600	16700	10556	15431	22,300	9560	11699
Antimony	ND	ND	143	52	ND	ND	ND	4
Arsenic	19	43	38	28	39	54	ND	19
Barium	145	165	..	..	170	..	[128]	100
Cadmium	4.6	14	19	18	8.1	17	ND	3
Calcium	11800	17236	[10500]	..	84400	[5,420]	[2855]	7316
Chromium	24	41	55	26	20	36	10	18
Cobalt	[21]	[32]	[20]	..	[14]	[25]	[18]R	13
Copper	48	89	74	66	42	35	[17]R	29
Iron	49000	112000	92589	166000	41600	113877	25682	29572
Lead	131	71	35	134	42	49	20	117
Cyanide	ND	2.4	ND	ND	ND	ND	ND	1.186
Magnesium	[3980]	[5000]	..	..	18897	[8,240]	3247	2782
Manganese	855	2810	1500	248	2014	542	447R	1003
Mercury	ND	0.15	ND	ND	ND	0.24	ND	0.098
Nickel	[36]	51	[49]	..	[40]	[39]	30R	19
Potassium	[1950]	[2450]	[2090]	[1574]	[6410]	[3,180]	[863]	2161
Sodium	ND	[1780]	[6720]	[1520]	[3260]	[1,830]	ND	143
Vanadium	[24]	[36]R	[28]	[34]R	[37]	[41]	[24]R	26
Zinc	235	355	1254	134	279	200	85R,E	113

(1) Maximum concentration in particular area
(2) Units mg/kg dry weight
R Spike recovery not within control limits
[ ] Positive values less than the contract required detection limit
E Estimated due to presence of interference
.. Detected below background
ND Not detected

TABLE 3-16

SUMMARY LIST OF PARAMETERS IDENTIFIED IN BURIED DRUMS
SUMMIT NATIONAL SITE

Parameter	Range	No. of Drums Detected In
Volatiles		
Chloromethane	20,000	1
Methylene Chloride	5,700B,**-1,800,000B,J	8
Acetone	1,600B,**-4,800,000B	7
Trans-1,2-Dichloroethene	370J,**-72,000	2
Chloroform	620B,J-770B,**	3
1,2-Dichloroethane	3,100**	1
2-Butanone	5,400B,**-84,000B,J	6
1,1,1-Trichloroethane	1,500J-19,000J	4
Trichloroethene	1,400J-140,000	4
Benzene	1,200J	1
Toluene	2,000J-340,000	8
Chlorobenzene	15,000J-110,000	2
Ethylbenzene	570J-190,000	5
Styrene	370,000	1
Total Xylenes	650J,**-840,000	6
Base/Neutrals and Acids		
Phenol	8,200J,**	1
Naphthalene	85,000J	1
Di-n-Butylphthalate	5,700J,**-28,000J	2
Pyrene	2,900J,**	1
Bis(2-ethylhexyl) Phthalate	21,000**	1
Di-n-Octyl Phthalate	43,000**-100,000**	1
Pesticides/PCB's		
None Detected		
Inorganics		
Aluminum	2,790-16,500	3
Cadmium	88R-139R	2
Calcium	2,700-6,240	6
Chromium	68	1
Copper	69.7-527	2

TABLE 3-16
(con't)

Parameter	Range	No. of Drums Detected In
Iron	226-25,700F	6
Cyanide	768-1,330F	2
Magnesium	809-2,340	4
Manganese	60.6-982	3
Nickel	55-241	8
Silicon	897-49,700E	5
Titanium	602-979	2
Zinc	111-198,000	4

Notes:

Organic results expressed in ug/kg; inorganic results expressed in mg/kg dry weight

B Analyte found in laboratory blank; indicates possible/probable laboratory contamination
E Value is estimated due to the presence of interference
F Sample concentration is greater than four times the spike value
** Sample analyzed at medium concentration

TABLE 3-17

SUMMARY LIST OF PARAMETERS IDENTIFIED IN TANK A SUMMIT NATIONAL SITE

Parameter	Range	Phases Detected
Volatiles		
Methylene Chloride	6,300B-1,200,000B,J	T,M,S
Acetone	36,000B-9,500,000B	M,S
2-Butanone	72,000B	M
Benzene	43,000-13,000,000	T,M,S
Toluene	64,000-54,000,000	T,M,S
Ethylbenzene	6,000-10,000,000	T,M,S
Total Xylenes	32,000-55,000,000	T,M,S
Base/Neutrals and Acids		
Naphthalene	12,000J,**-360,000**	T,M
2-Methylnaphthalene	11,000J,**-470,000**	T,M
Acenaphthene	28,000J,**	T
Fluorene	4,200J,**	T
Pentachlorophenol	34,000J,**	S
Phenanthrene	34,000**	S
Anthracene	4,000J,**	S
Di-n-butylphthalate	28,000J,**	T
Pyrene	4,700J,**	S
Benzo(a)Anthracene	2,000J,**	S
Chrysene	2,800J,**	S
Benzo(b)Fluoranthene	2,300J,**	S
Benzo(k)Fluoranthene	1,600J,**	S
Pesticides/PCB's		
None Detected		
Inorganics		
Aluminum	6,210	T
Calcium	1,680-2,680	T,M
Copper	120	T
Iron	162,000F	T
Lead	460	T
Magnesium	871	T
Manganese	331	T
Silicon	2,160-21,900E	T,M

TABLE 3-18

SUMMARY OF PARAMETERS IDENTIFIED IN TANK BY INCINERATOR
SUMMIT NATIONAL SITE

Parameter	Range	No. of Samples Detected
Volatiles		
Methylene Chloride	110,000B	2
1,1-Dichloroethene	50,000J	1
2-Butanone	250,000-270,000	2
1,1,1-Trichloroethane	3,120,000-3,550,000	2
Toluene	240,000-260,000	2
Ethylbenzene	140,000-160,000	2
Total Xylenes	250,000	1
Base/Neutrals and Acids		
Phenol	67,000J	1
4-Methylphenol	525,000-664,000	2
2,4-Dimethylphenol	101,000-109,000	2
Naphthalene	23,000J-24,000J	2
Phenanthrene	25,000J	1
Anthracene	25,000J-28,000J	2
Di-n-butylphthalate	16,000J-112,000	2
Bis(2-ethylhexyl) Phthalate	281,000-298,000	2
Pesticides/PCB's		
Delta-BHC	6,250**	1
Aldrin	4,750**	1
Endosulfan I	1,700**	1
4,4'-DDE	1,800**	1
Inorganics		
Aluminum	699-803	2
Barium	88-89	2
Cadmium	2.4-7.9	2
Chromium	189R-202R	2
Copper	28	2
Iron	2050	2
Lead	168-195	2

TABLE 3-18
(con't)

Parameter	Range	No. of Samples Detected
Manganese	14-17	2
Sodium	4,760-4,800	2
Thallium	[2.3]	1
Tin	18R	1
Zinc	67-71	2

Notes:

Based on duplicate samples TK001001 and TK001002 from 11/14/84

Organic results expressed in ug/kg; inorganic results expressed in mg/kg dry weight.

B Analyte found in laboratory blank; indicates possible/probable laboratory contamination
J An estimated value
R Spike sample recovery is not within control limits
** Sample analyzed at medium concentration
[] Positive values less than the contract required detection limit

TABLE 3-19

ORGANIC CONTAMINANTS DETECTED IN AIR SAMPLES
SUMMIT NATIONAL SITE

Sample No.	S01		S02		S03		S04		S05		S06	
Location	Downwind		Midrange		Upwind		Downwind		Midrange		Upwind	
Date Sampled	9/12/84		9/12/84		9/12/84		9/13/84		9/13/84		9/13/84	
	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back
Tetrachloroethene	--	--	<0.001	<0.001	<0.001	--	--	--	--	--	--	--
Toluene	--	--	<0.001	--	<0.001	--	--	--	--	--	--	--

Notes:

All concentrations reported in parts per million (ppm)
-- Not detected
Front - Front section of charcoal tube
Back - Back section of charcoal tube

Attachment 4 - Detailed Cost Analysis Summary

Attachment 4

List of Tables

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Table 4-2 Cost Estimate Summary Alternative 3

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Table 4-5 Cost Estimate Summary Alternative 6

Table 4-6 Cost Estimate Summary Alternative 7

Table 4-7 Cost Estimate Summary Alternative 8

Table 4-7 Cost Estimate Summary Alternative 9

TABLE 4-1
Cost Estimate Summary
Alternative 2
Resident Relocation with Monitoring

Item	Capital Cost	Annual O & M	Present Worth 30 Years O&M/Replacemement		
			3%	5%	10%
I. WATSON RELOCATION					
Move Watson Residence	$21,000				
Extend Site Boundary	$20,000				
Extend Site Fence	$20,000	$1,000	$20,000	$15,000	$9,000
II. MONITORING					
Runoff Monitoring		$16,000	$310,000	$250,000	$150,000
Groundwater Monitoring	$32,000	$54,000	$1,100,000	$830,000	$510,000
CONSTRUCTION SUBTOTAL	$93,000		$1,400,000	$1,100,000	$670,000
Health and Safety (10%)	$9,000				
Bid Contigency (15%)	$14,000				
Scope Contingency (20%)					
CONSTRUCTION TOTAL	$120,000				
Permitting & Legal (5%)	$6,000				
Services During Construction (8%)	$10,000				
TOTAL IMPLEMENTATION COST	$140,000				
Engineering & Design (10%)	$14,000				
TOTAL CAPITAL COSTS	$150,000				
PRESENT WORTH			$1,600,000	$1,300,000	$820,000

TABLE 4-2

Cost Estimate Summary
Alternative 3
Capping with Drum and Tank Incineration

Item	Capital Cost	Annual O & M	Present Worth 30 Years O&M/Replacement 3%	5%	10%
I. GENERAL SITE PREPARATION					
Decontamination Facility	$10,000				
Move Watson Residence	$21,000				
Extend Site Boundary	$20,000				
Extend Site Fence	$20,000	$1,000	$20,000	$15,000	$9,000
Reroute S. Drainage Ditch	$75,000				
Diversion Berm	$30,000				
Demolition of Site Structures	$54,000				
Removal & Incineration of Drums & Tanks	$1,300,000				
Regrading	$240,000				
II. MULTI-LAYER CAP					
Clay Layer	$670,000				
HDPE Liner	$310,000	$5,000	$98,000	$77,000	$47,000
Drainage Layer	$220,000				
Vegetative Soil Layer	$580,000		$250,000	$180,000	$86,000 *
Revegetation	$20,000	$1,000	$55,000	$40,000	$21,000 *
III. GROUNDWATER					
Slurry Wall	$690,000				
Wells in Water Table Aquifer	$1,200,000	$180,000	$3,500,000	$2,800,000	$1,700,000
Oil Skimmers	$90,000				
Wells in Upper Intermediate Unit	$82,000	$15,000	$290,000	$230,000	$140,000
5 Year Pump Replacement	-		$810,000	$610,000	$340,000
IV. WATER TREATMENT					
Total System 50 GPM	$250,000	$87,000	$1,700,000	$1,300,000	$820,000
V. MONITORING					
Mobile Laboratory	$97,000				
Runoff Monitoring		$16,000	$310,000	$250,000	$150,000
Groundwater Monitoring	$32,000	$54,000	$1,100,000	$830,000	$510,000
CONSTRUCTION SUBTOTAL	$6,000,000		$8,100,000	$6,300,000	$3,800,000
Health and Safety (10%)	$600,000				
Bid Contigency (15%)	$900,000				
Scope Contingency (20%)	$1,200,000				
CONSTRUCTION TOTAL	$8,700,000				
Permitting & Legal (5%)	$440,000				
Services During Construction (8%)	$700,000				
TOTAL IMPLEMENTATION COST	$10,000,000				
Engineering & Design (10%)	$1,000,000				
TOTAL CAPITAL COSTS	$11,000,000				
PRESENT WORTH			$19,000,000	$17,000,000	$15,000,000

* Present worth calculated assuming replacement of 30% topsoil, regrading, and revegetating every 10 yrs.

TABLE 4-4

Cost Estimate Summary
Alternative 5
Incineration of Hotspot Soil

Reproduced from best available copy.

Item	Capital Cost	Annual O & M	Present Worth 30 Years O&M/Replacement 3%	5%	10%
I. GENERAL SITE PREPARATION					
Decontamination Facility	$14,000	$4,500	$24,000	$23,000	$20,000 *
Move Watson Residence	$21,000				
Extend Site Boundary	$20,000				
Extend Site Fence	$20,000	$1,000	$20,000	$15,000	$9,400
Reroute S. Drainage Ditch	$75,000				
Diversion Berm	$30,000	$5,000	$27,000	$25,000	$22,000 *
Demolition of Site Structures	$54,000				
Buildings for Incinerator	$120,000				
Soil Storage Building	$44,000				
II. INCINERATION					
Capital	$1,300,000				
Maintenance		$50,000	$270,000	$250,000	$220,000 *
Operation		$1,800,000	$9,800,000	$9,100,000	$7,800,000 *
III. EXCAVATION & LOADING OF CONTAMINATED MATERIAL					
Drum Excavation/Classification	$580,000				
Soil Excavation	$180,000				
Soil Handling and Loading	$200,000				
Backfill Ash and Compact	$170,000				
IV. DOUBLE LINER SYSTEM					
Clay Layer	$170,000				
Drainage System	$67,000				
HDPE Liner	$130,000	$3,000	$59,000	$46,000	$28,000
Geotextile	$46,000				
V. MULTI-LAYER CAP					
Clay Layer	$670,000				
HDPE Liner	$310,000	$5,000	$98,000	$77,000	$47,000
Drainage Layer	$220,000				
Vegetative Soil Layer	$580,000		$250,000	$160,000	$86,000 **
Revegetation	$20,000	$1,000	$55,000	$40,000	$21,000 **
VI. GROUNDWATER					
Slurry Wall	$690,000				
Wells in Water Table Aquifer	$1,200,000	$180,000	$3,500,000	$2,800,000	$1,700,000
Oil Skimmers	$90,000				
Wells in Upper Intermediate Unit	$82,000	$15,000	$290,000	$230,000	$140,000
5 Year Pump Replacement			$810,000	$610,000	$340,000
VII. WATER TREATMENT					
Total System 50 GPM	$250,000	$87,000	$1,700,000	$1,300,000	$820,000
VIII. MONITORING					
Onsite Laboratory	$400,000	$110,000	$600,000	$560,000	$480,000 *
Runoff Monitoring		$16,000	$310,000	$250,000	$150,000
Groundwater Monitoring	$32,000	$54,000	$1,100,000	$830,000	$510,000
CONSTRUCTION SUBTOTAL	$7,800,000		$19,000,000	$16,000,000	$12,000,000
Health and Safety (10%)	$780,000				
Bid Contingency (15%)	$1,200,000				
Scope Contingency (20%)	$1,600,000				
CONSTRUCTION TOTAL	$11,000,000				
Permitting & Legal (5%)	$550,000				
Services During Construction (8%)	$900,000				
TOTAL IMPLEMENTATION COST	$12,000,000				
Engineering & Design (10%)	$1,100,000 ***				
TOTAL CAPITAL COSTS	$13,000,000				
PRESENT WORTH			$32,000,000	$29,000,000	$25,000,000

* Present worth calculated over 6 yr. treatment period.
** Present worth calculated assuming replacement of 30% topsoil, regrading, and revegetating every 10 yrs.
*** Engineering and design costs do not include pre-engineered incineration unit.

TABLE 4-5

Cost Estimate Summary
Alternative 6
Incineration of Vadose Soil

Item	Capital Cost	Annual O & M	Present Worth 30 Years O&M/Replacemement 3%	5%	10%
I. GENERAL SITE PREPARATION					
Decontamination Facility	$14,000	$4,500	$35,000	$32,000	$26,000 *
Move Watson Residence	$21,000				
Extend Site Boundary	$20,000				
Extend Site Fence	$20,000	$1,000	$20,000	$15,000	$9,400
Reroute S. Drainage Ditch	$75,000				
Diversion Berm	$30,000	$5,000	$39,000	$36,000	$29,000 *
Demolition of Site Structures	$54,000				
Buildings for Incinerator	$120,000				
Soil Storage Building	$44,000				
II. INCINERATION					
Capital	$2,600,000				
Maintenance		$100,000	$800,000	$700,000	$580,000 *
Operation		$3,500,000	$27,000,000	$25,000,000	$20,000,000 *
III. EXCAVATION & LOADING OF CONTAMINATED MATERIAL					
Drum Excavation/Classification	$580,000				
Soil Excavation	$580,000				
Soil Handling and Loading	$920,000				
Backfill Asn and Compact	$760,000				
IV. DOUBLE LINER SYSTEM					
Clay Layer	$670,000				
Drainage System	$260,000				
HDPE Liner	$520,000	$5,000	$98,000	$77,000	$47,000
Geotextile	$180,000				
V. MULTI-LAYER CAP					
Clay Layer	$670,000				
HDPE Liner	$310,000	$5,000	$98,000	$77,000	$47,000
Drainage Layer	$220,000				
Vegetative Soil Layer	$580,000		$250,000	$180,000	$86,000 **
Revegetation	$20,000	$1,000	$55,000	$40,000	$21,000 **
VI. GROUNDWATER					
Slurry Wall	$690,000				
Wells in Water Table Aquifer	$1,200,000	$180,000	$3,500,000	$2,800,000	$1,700,000
Oil Skimmers	$90,000				
Wells in Upper Intermediate Unit	$62,000	$15,000	$290,000	$230,000	$140,000
5 Year Pump Replacement			$810,000	$610,000	$340,000
VII. WATER TREATMENT					
Total System 50 GPM	$250,000	$87,000	$1,700,000	$1,300,000	$820,000
VIII. MONITORING					
Onsite Laboratory	$400,000	$110,000	$860,000	$780,000	$630,000 *
Runoff Monitoring		$16,000	$310,000	$250,000	$150,000
Groundwater Monitoring	$32,000	$54,000	$1,100,000	$830,000	$510,000
CONSTRUCTION SUBTOTAL	$12,000,000		$37,000,000	$33,000,000	$25,000,000
Health and Safety (10%)	$1,200,000				
Bid Contigency (15%)	$1,800,000				
Scope Contingency (20%)	$2,400,000				
CONSTRUCTION TOTAL	$17,000,000				
Permitting & Legal (5%)	$850,000				
Services During Construction (8%)	$1,400,000				
TOTAL IMPLEMENTATION COST	$19,000,000				
Engineering & Design (10%)	$1,500,000 ***				
TOTAL CAPITAL COSTS	$21,000,000				
PRESENT WORTH			$58,000,000	$54,000,000	$46,000,000

* Present worth calculated over 9 yr. treatment period.

** Present worth calculated assuming replacement of 20% topsoil, regrading, and revegetating every 10 yrs.

***

TABLE 4-6

Cost Estimate Summary
Alternative 7
Incineration of All Unconsolidated Material

Item	Capital Cost	Annual O & M	Present Worth 30 Years O&M/Replacemement 3%	5%	10%
I. GENERAL SITE PREPARATION					
Decontamination Facility	$14,000	$4,500	$45,000	$40,000	$31,000 *
Move Watson Residence	$21,000				
Extend Site Boundary	$20,000				
Extend Site Fence	$20,000	$1,000	$20,000	$15,000	$9,000
Reroute S. Drainage Ditch	$75,000				
Diversion Berm	$30,000	$5,000	$50,000	$44,000	$34,000 *
Demolition of Site Structures	$54,000				
Soil Storage Building	$44,000				
II. EXCAVATION & BACKFILLING OF ALL UNCONSOLIDATED MATERIAL					
Drum Excavation/Classification	$580,000				
Soil Excavation	$4,300,000				
Dewatering Excavation	$500	$1,000	$10,000	$9,000	$7,000 *
Soil Handling and Loading	$3,800,000				
Backfill Clean Material and Compact	$2,600,000				
Backfill Treated Soil and Compact	$3,100,000				
III. INCINERATION					
Capital	$4,000,000				
Maintenance		$200,000	$2,000,000	$1,800,000	$1,400,000 *
Operation		$11,680,000	$120,000,000	$100,000,000	$80,000,000 *
IV. DOUBLE LINER SYSTEM					
Clay Layer	$670,000				
Drainage System	$260,000				
HDPE Liner	$520,000	$5,000	$98,000	$77,000	$47,000
Geotextile	$180,000				
V. MULTI-LAYER CAP					
Clay Layer	$670,000				
HDPE Liner	$310,000	$5,000	$98,000	$77,000	$47,000
Drainage Layer	$220,000				
Vegetative Soil Layer	$580,000		$250,000	$180,000	$86,000 **
Revegetation	$20,000	$1,000	$55,000	$40,000	$21,000 **
VI. GROUNDWATER					
Slurry Wall	$690,000				
Drains in Water Table Aquifer	$240,000	$2,500	$49,000	$38,000	$24,000
Wells in Upper Intermediate Unit	$82,000	$15,000	$294,000	$231,000	$141,000
VII. WATER TREATMENT					
Total System 50 GPM	$250,000	$87,000	$1,700,000	$1,300,000	$820,000
VIII. MONITORING					
Mobile Laboratory	$400,000	$110,000	$1,100,000	$1,000,000	$750,000 *
Runoff Monitoring		$16,000	$310,000	$250,000	$150,000
Monitoring Wells	$32,000	$54,000	$1,100,000	$830,000	$510,000
CONSTRUCTION SUBTOTAL	$24,000,000		$127,000,000	$106,000,000	$84,000,000
Health and Safety (10%)	$2,400,000				
Bid Contigency (15%)	$3,600,000				
Scope Contingency (20%)	$4,800,000				
CONSTRUCTION TOTAL	$35,000,000				
Permitting & Legal (5%)	$1,800,000				
Services During Construction (8%)	$2,800,000				
TOTAL IMPLEMENTATION COST	$40,000,000				
Engineering & Design (10%)	$3,300,000 ***				
TOTAL CAPITAL COSTS	$43,000,000				
PRESENT WORTH			$170,000,000	$149,000,000	$127,000,000

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* Present worth calculated over 12 yr. treatment period.

** Present worth calculated assuming replacement of 30% topsoil, regrading, and revegetating every 10 yrs.

*** Engineering and design costs do not include pre-engineered incineration units.

TABLE 4-7

Cost Estimate Summary
Alternative 8
In Situ Vitrification of Hotspot Soil

Item	Capital Cost	Annual O & M	Present Worth 30 Years O&M/Replacemement 3%	5%	10%
I. GENERAL SITE PREPARATION					
Decontamination Facility	$14,000	$4,500	$9,000	$8,000	$8,000 $
Move Watson Residence	$21,000				
Extend Site Boundary	$20,000				
Extend Site Fence	$20,000	$1,000	$20,000	$15,000	$9,000
Reroute S. Drainage Ditch	$75,000				
Diversion Berm	$30,000	$5,000	$10,000	$9,000	$9,000 $
Demolition of Site Structures	$54,000				
Removal & Incineration of Drums & Tanks	$1,300,000				
II. IN SITU VITRIFICATION					
Capital	$2,200,000				
Operation and Maintenance		$5,500,000	$10,500,000	$10,200,000	$9,500,000 $
III. BACKFILL AND CAP ENTIRE SITE					
Backfill Subsided Areas with Clean Fill	$100,000				
Clay Layer	$670,000				
HDPE Liner	$310,000	$5,000	$98,000	$77,000	$47,000
Drainage Layer	$220,000				
Vegetative Soil Layer	$580,000		$250,000	$190,000	$86,000 $$
Revegetation	$20,000	$1,000	$55,000	$40,000	$21,000 $$
IV. GROUNDWATER					
Slurry Wall	$690,000				
Wells in Water Table Aquifer	$1,200,000	$180,000	$3,500,000	$2,800,000	$1,700,000
Oil Skimmers	$90,000				
Wells in Upper Intermediate Unit	$82,000	$15,000	$290,000	$230,000	$140,000
5 Year Pump Replacement			$810,000	$610,000	$340,000
VI. WATER TREATMENT					
Total System 50 GPM	$250,000	$87,000	$1,700,000	$1,300,000	$820,000
VII. MONITORING					
Mobile Laboratory	$400,000	$110,000	$210,000	$200,000	$190,000 $
Runoff Monitoring		$16,000	$310,000	$250,000	$150,000
Monitoring Wells	$32,000	$54,000	$1,100,000	$830,000	$510,000
CONSTRUCTION SUBTOTAL	$8,000,000		$19,000,000	$17,000,000	$14,000,000
Health and Safety (10%)	$800,000				
Bid Contigency (15%)	$1,200,000				
Scope Contingency (20%)	$1,600,000				
CONSTRUCTION TOTAL	$12,000,000				
Permitting & Legal (5%)	$600,000				
Services During Construction (8%)	$1,000,000				
TOTAL IMPLEMENTATION COST	$14,000,000				
Engineering & Design (10%)	$1,400,000				
TOTAL CAPITAL COSTS	$15,000,000				
PRESENT WORTH			$34,000,000	$32,000,000	$29,000,000

$ Present worth calculated over 2 yr. treatment period.

$$ Present worth calculated assuming replacement of 30% topsoil, regrading, and revegetating every 10 yrs.

TABLE 4-8

Cost Estimate Summary
Alternative 9
In Situ Vitrification of Vadose Soil

Item	Capital Cost	Annual O & M	Present Worth 30 Years O&M/Replacement 3%	5%	10%
I. GENERAL SITE PREPARATION					
Decontamination Facility	$14,000	$4,500	$24,000	$22,000	$20,000 ‡
Move Watson Residence	$21,000				
Extend Site Boundary	$20,000				
Extend Site Fence	$20,000	$1,000	$20,000	$15,000	$9,000
Reroute S. Drainage Ditch	$75,000				
Diversion Berm	$30,000	$5,000	$27,000	$25,000	$22,000 ‡
Demolition of Site Structures	$54,000				
Rough Grade Site Prior to ISV	$14,000				
Removal & Incineration of Drums & Tanks	$1,300,000				
II. IN SITU VITRIFICATION					
Capital	$2,200,000				
Operation and Maintenance		$5,200,000	$28,000,000	$26,000,000	$23,000,000 ‡
III. SOIL COVER AND REVEGETATE					
Cover with Topsoil	$380,000				
Revegetation	$20,000	$1,000	$20,000	$15,000	$9,000
IV. GROUNDWATER					
Slurry Wall	$690,000				
Wells in Water Table Aquifer	$1,200,000	$150,000	$3,500,000	$2,800,000	$1,700,000
Oil Skimmers	$90,000				
Wells in Upper Intermediate Unit	$82,000	$15,000	$290,000	$230,000	$140,000
5 Year Pump Replacement			$810,000	$610,000	$340,000
VI. WATER TREATMENT					
Total System 50 GPM	$250,000	$27,000	$1,700,000	$1,300,000	$820,000
VII. MONITORING					
Mobile Laboratory	$400,000	$110,000	$600,000	$560,000	$480,000 ‡
Runoff Monitoring		$15,000	$310,000	$250,000	$150,000
Monitoring Wells	$33,000	$54,000	$1,100,000	$830,000	$510,000
CONSTRUCTION SUBTOTAL	$7,000,000		$36,000,000	$33,000,000	$27,000,000
Health and Safety (10%)	$700,000				
Bid Contingency (15%)	$1,100,000				
Scope Contingency (20%)	$1,400,000				
CONSTRUCTION TOTAL	$10,000,000				
Permitting & Legal (5%)	$500,000				
Services During Construction (8%)	$800,000				
TOTAL IMPLEMENTATION COST	$11,000,000				
Engineering & Design (10%)	$1,100,000				
TOTAL CAPITAL COSTS	$12,000,000				
PRESENT WORTH			$48,000,000	$45,000,000	$39,000,000

‡ Present worth calculated over 6 yr. treatment period.

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Briefing on the Record of Decision for the Summit National Site
Deerfield, Ohio

I. Site History

The Summit National site was a former solvent recycling and disposal facility located in Deerfield, Ohio. Solvents, paint sludges, phenols, cyanide, arsenic, and other liquid wastes were stored, incinerated, and buried or dumped during 1973 through 1978. In 1983, Summit National site was added to the National Priorities List (NPL). In February 1988, U.S. EPA concluded in a Remedial Investigation (RI) report that toxic waste had contaminated all onsite medium and presented an unacceptable risk to human health and the environment. Offsite areas have also been affected by site operations. Contamination includes a variety of organic and inorganic compounds. The RI conclusions and Feasibility Study justify the need for remedial action at the Summit National site.

II. Site Characterization

The remedial investigation detected contamination onsite in all medium. Over 65 hazardous substances exceeding background concentrations were detected in onsite soils, 43 in onsite surface water, 29 in onsite sediments, and over 25 in the shallow groundwater system beneath the site. Contamination includes organic and inorganic compounds. The major contaminants that represent the most significant risks to human health are as follows:

Major Organic Compounds

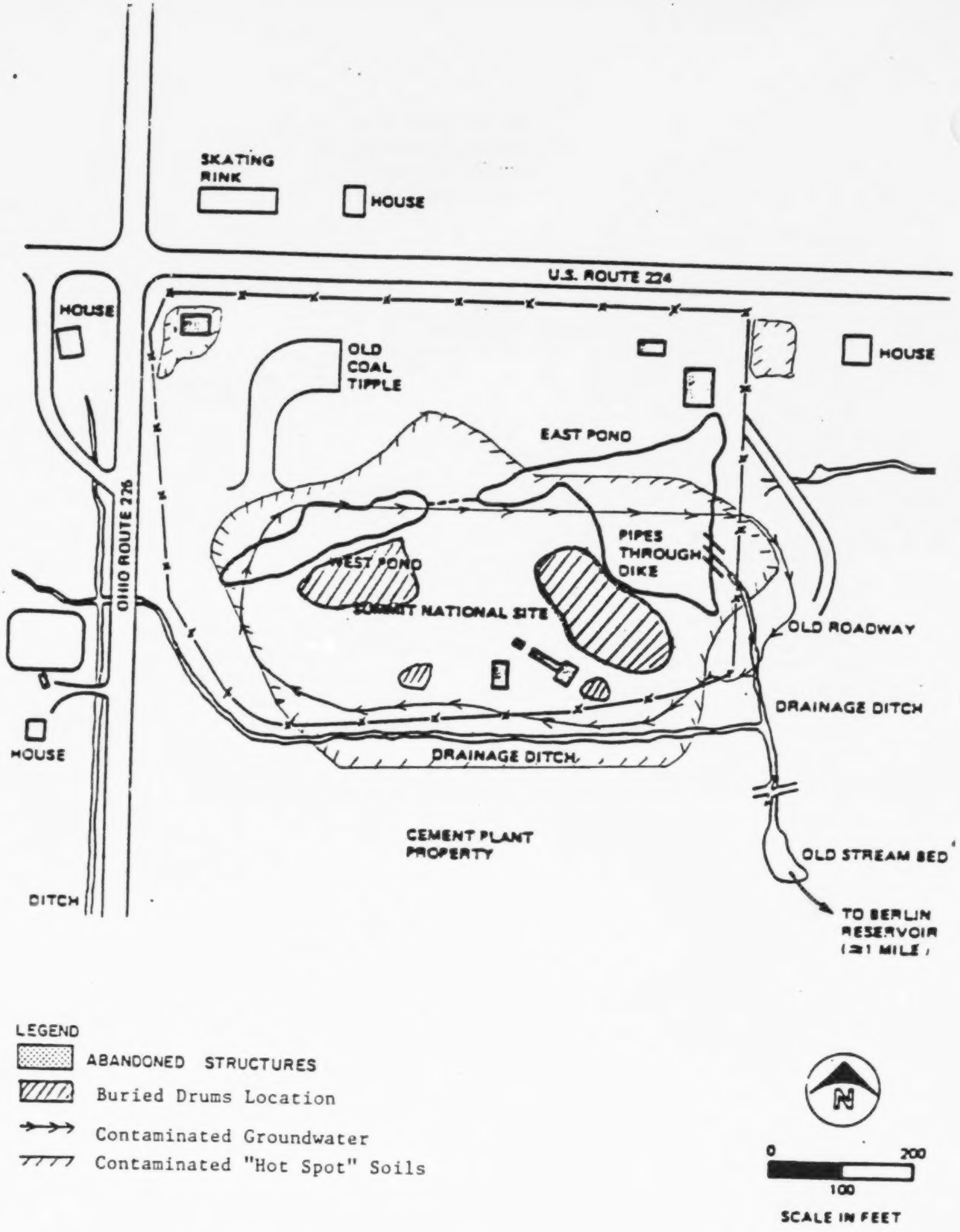
- Bis (2-ethylhexyl)Phthalate
- 1,2 Dichloroethane
- 1,1 Dichloroethene
- Trichloroethene
- Hexaclorobenzene
- PAHs
- PCBs

Major Inorganic Compounds

- Antimony
- Barium
- Cadium
- Chromium
- Cyanide
- Zinc

These contaminants occur in high concentrations and frequency onsite in the groundwater system, soils, sediments and surface water. The RI also identified the existence of about 900-1600 buried drums and 4 buried tanks containing hazardous substances. Offsite areas have also been affected with similar compounds by site operations to the south and eastern perimeter. The extent of contamination is depicted in Figure 1. There are nine residential wells within 1000 feet of the site. These wells have not been affected by the site.

The Deerfield Township is about 76% undeveloped or agriculture. The remaining areas have been developed for residential, industrial, commercial, and recreational purposes. The area immediately surrounding the site has few rural residences, two landfills, a cement plant, a roller skating rink, and a used tire storage lot. (See Figure 1).


SKATING RINK
HOUSE
U.S. ROUTE 224
HOUSE
OLD COAL TIPPLE
HOUSE
EAST POND
OHIO ROUTE 226
PIPES THROUGH DIKE
WEST POND
SUMMIT NATIONAL SITE
OLD ROADWAY
DRAINAGE DITCH
HOUSE
DRAINAGE DITCH
CEMENT PLANT PROPERTY
OLD STREAM BED
TO BERLIN RESERVOIR (≅1 MILE)
DITCH
LEGEND
ABANDONED STRUCTURES
Buried Drums Location
Contaminated Groundwater
Contaminated "Hot Spot" Soils
N
0
100
200
SCALE IN FEET

NOTE: ALL LOCATIONS OF STRUCTURES AND PHYSICAL FEATURES APPROXIMATE.

SOURCE: MODIFIED FROM USEPA

FIGURE 1
SITE MAP
SUMMIT NATIONAL RI

The potential receptors are residents and workers near the site. The potential exposure pathways are groundwater consumption, and soil ingestion and dermal absorption. The highest risk and worst case scenario associated with each medium are as follows:

Current Conditions

Soils	3 X 10^{-5}	Onsite trespassers
Sediments	6 X 10^{-6}	Children in offsite ditches

Future Conditions

Soils	5 X 10^{-3}	Onsite residents
Groundwater	3 X 10^{-1}	Onsite residents using the watertable as a drinking water source

III.Description of Alternatives

The Feasibility Study presented nine alternatives ranging from no action to the maximum action practicable. The alternatives and costs are as follows:

Alternative	Cost
1. No Action	
2. Resident Relocation with Monitoring	$ 820,000
3. Capping with Offsite Drum and Tank Incineration	$ 15,000,000
4. RCRA Landfill for Vadose Soil	$ 22,000,000
5. Onsite Incineration of "Hot Spot" Soils (32,000 c.y.)	$ 25,000,000
6. Onsite Incineration of Contaminated Vadose Soils (105,000 c.y.)	$ 46,000,000
7. Onsite Incineration of All Unconsolidated Materials (430,000 c.y.)	$127,000,000
8. In-situ Vitrification of "Hot Spot" Soils (32,000 c.y.)	$ 29,000,000
9. In-situ Vitrification of Contaminated Vadose Soils (105,000 c.y.)	$ 39,000,000

IV.Nine Criteria Analysis

The alternatives were evaluated based on the nine criteria. All alternatives satisfy the evaluation criteria, with the exception of Alternatives 1 and 2. The alternatives differ in the extent to which each criteria is satisfied. The attached matrix summarizes how each alternative is evaluated. (See Figure 2)

The alternative that best satisfies the evaluation criteria is Alternative 5 - Onsite Incineration of "Hot Spot" Soils.

V.Cost Effectiveness Analysis

The alternatives that provide overall effectiveness, protectiveness, and implementability at a reasonable cost are as follows:

Alternative	Cost
Capping with Offsite Drum and Tank Incineration	$15,000,000
Onsite Incineration of "Hot Spot" Soils	$25,000,000
In-situ Vitrification of "Hot Spot" Soils	$29,000,000

Alternative 3 did not include treatment of contaminated soils which represented a concern with leaching and allowing groundwater conditions to worsen. In addition, offsite treatment and transportation is least favorable due to the limited RCRA capacity, and implications and availability of transportation services. The Ohio EPA would not accept this alternative and would not waive a State ARAR which would require U.S. EPA to provide an alternate drinking water supply to residents within a 1000 foot radius.

Alternative 8 proposed In-situ Vitrification, which is an innovative technology that has not been tried and proven at hazardous waste sites with multi-contaminants similar to the Summit National Site. Based on its uncertain reliability, performance, and availability, it was less favorable than Alternative 5. Therefore, Alternative 5 Onsite Incineration of "Hot Spot" Soils is the preferred alternative.

VI.Preferred Alternative

The major components of the preferred alternative are as follows:

* Excavation and Onsite Incineration of the following waste; (Activity to be completed within a 5 year time frame.)

Contaminated "Hot Spot" Soils	32,000 c.y.
Contaminated Offsite Sediments	1,500 c.y.
Contents of Buried Drums	900 - 1600

* Groundwater treatment of the Intermediate aquifer to be completed within a 5 to 10 year time frame.
* Dewatering of the water table to be completed within a 2 to 10 year time frame.
* Construction of a Double Synthetic Liner to contain the incinerated waste material.
* Construction of a Multi-layer Cap across the entire site (16 acres).
* Removal of Onsite Structures.
* Installation of a Slurry Wall around site perimeter to a depth of 40 feet.

	ALTERNATIVE 1 No Action	ALTERNATIVE 2 Monitoring with Residual Relocation	ALTERNATIVE 3 Capping and Offsite Drum Removal	ALTERNATIVE 4 Onsite RCRA Landfill for Vadose Soil	ALTERNATIVE 5 Therm[illegible] of "Hot Spot" S[illegible]	ALTERNATIVE 6 Thermal Treatment of Contaminated Vadose Soil	ALTERNATIVE 7 Thermal Treatment of All Contaminated Material	ALTERNATIVE 8 In-Situ Vitrification of "Hot Spot" Soils	ALTERNATIVE 9 In-Situ Vitrification of Contaminated Vadose So
rotection of Human Health and the ironment	Results in unacceptable health risks which exceed 10[illegible]	Minimal protection by eliminating exposure to current conditions	Adequate protection by treating buried drums and tanks, ground water and surface water. Direct contact with contaminated soils and sediments is eliminated by the multi-layer cap.	Provides additional level of protection than Alternative 3 containing the vadose soil in an onsite RCRA landfill	Adequate protection by treating major sources of contamination, including onsite incineration of "hot spot" soils and containment of residuals	Same as Alternative 5, except additional volume of soils to be treated	Same as Alternative 6, except additional volume of soils to be treated	Adequate protection as in Alternative 3 with the additional treatment of "hot spot" soils by encapsulating contaminants	Same as Alternative 8 except additional volume of soils to be treated
mpliance with ARARs	Does not attain ARARs since site conditions are not altered	Same as Alternative 1	Attains ARARs	Attains ARARs	Attains ARARs	Attains ARARs	Attains ARARs	Attains ARARs	Attains ARARs
duction of toxicity, mobility and volume TMV)	No reduction in TMV	No reduction in TMV	Achieves reduction in TMV for buried drums and tanks, ground water and surface water. Reduction in mobility for soils is achieved by use of the cap.	Same as Alternative 3 with the additional reduction in mobility by enclosing vadose soils in RCRA landfill	Additional reduction in TMV by incinerating "hot spot" soils	Additional reduction in TMV over Alternative 5	Additional reduction in TMV over Alternative 6	Same as Alternative 3 except additional reduction in mobility is achieved by encapsulating contaminants	Additional reduction in TMV over Alternative 8
hort Term Effectiveness	Not effective	Most effective since it achieves its response objectives within a short time frame	Same as Alternative 2.	The comprehensive excavation and handling of 105,000 cu. yds. of soil could result in short term adverse effects	Short term effects could occur due to excavation and incineration of drums and "hot spot" soils	Additional short term adverse effects over Alternative 5 due to a longer time frame of 9 years	Least effective of all in the short term due to the 12 year time frame	Short-term effects could occur due to the excavation of buried drums and tanks	Same as Alternative 8
ng Term Effectiveness	Not effective	Not effective since site conditions are not altered	Provides long term effectiveness, however, the untreated soils left on site may result in long term management.	Provides a high degree of long-term effectiveness but requires long-term management	Same as Alternative 4	Same as Alternative 5 except a lesser amount of residuals are left behind on site	Offers the highest degree of long term effectiveness since it destroys all affected media	Provides long-term effectiveness	Same as Alternative 8
ementability	Not applicable	Monitoring and relocation are technically implementable	Implementable, but with transportation and offsite RCRA capacity considerations	Same as Alternative 3, with the added difficulty of handling 105,000 cu. yds. of vadose soils	Implementability considerations are associated with handling and treating "hot spot" soils	Same as Alternative 5 except additional difficulties with handling and treatment a greater amount of soils	Least implementable due to the excessive amount of soils to handle (430,000 cu. yds.)	Implementability considerations are associated with the availability of units and reliability of this innovative technology	Same as Alternative 8
st[a]	$0	$420,000	$15,000,000	$22,000,000	$25,000,000	$46,000,000	$117,000,000	$29,000,000	$39,000,000
ate Acceptance[b]	Comments do not address this alternative	Comments do not address this alternative	Comments do not address this alternative	Comments do not address this alternative	Acceptance is uncertain based on comments received	Comments do not address this alternative	Comments do not address this alternative	Comments received but do not indicate a preference	Same as Alternative 8
munity Acceptance[c]	Unacceptable by the general community	Same as Alternative 1	No specific comments regarding this alternative	Same as Alternative 3	Acceptable by general community with some concerns regarding emissions resulting from incineration	No specific comments regarding this alternative	Same as Alternative 6	No comments regarding this alternative	Same as Alternative 8

Notes:

a Cost estimates are a present worth value based on a 30 year period at 10% interest.

b State acceptance is based on comments received during the RI/FS process and public comment period.

c Community acceptance is based on comments received during the public meeting and public comment period.

FIGURE 2
SUMMARY OF DETAILED
ANALYSIS OF ALTERNATIVES
SUMMIT NATIONAL SITE

- * Elimination of Onsite Surface Water.
- * Site Extension (4 acres) and Relocation on One Home Owner (No Occupants).
- * Access and Deed Restrictions
- * Groundwater and Surface Water Monitoring Programs

* Total Cost $25,000,000

A detailed site plan and cross section are presented in Figures 3 and 4 respectively.

The preferred alternative provides the best balance among the nine criteria. The strongest benefit is that the remedy will permanently reduce contamination to non-hazardous levels leaving behind an acceptable residual risk of 2×10^{-5} in soils. In addition, the alternative eliminates all exposure pathways, thus eliminating risk. This alternative can be readily implemented at a reasonable cost and utilizes permanent solutions and treatment technologies to the maximum extent practicable.

VII. Enforcement Status

In November, 1987, the U.S. EPA, State of Ohio, DOJ, OAG, and PRPs started the legal Remedial Design/Remedial Action Consent Decree negotiations. The negotiations are currently on-going between all parties. Once the ROD is finalized, the components of the Consent Decree negotiations will commence under Section 122 (c) CERCLA.

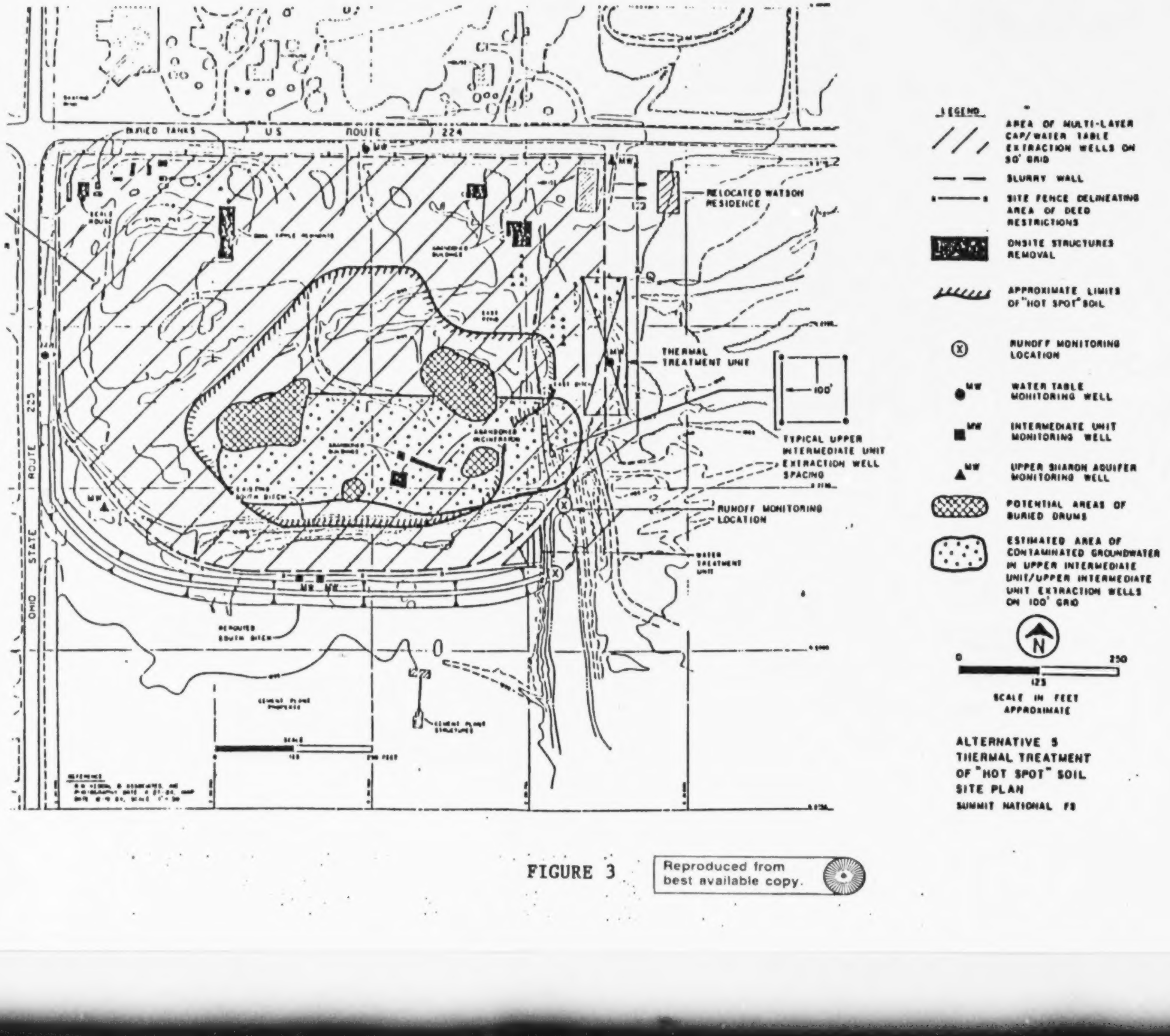
VIII. Issues

State:

The major issue raised by Ohio EPA is the definition and volume of "hot spot" soils. After further review and discussion, it was agreed by both parties to redefine the removal scenario which resulted in an incremental volume from 27,000 c.y. to 32,000 c.y. at an additional cost of approximately $1,000,000. This additional soil volume increased the preferred remedial alternative from $24,000,000 to $25,000,000. Based on the latest meeting (May 26, 1988), the Ohio EPA, has verbally approved the preferred remedial alternative. Ohio EPA will provide us with a letter of concurrence by June 17, 1988.

PRP:

The PRPs have commented on the preferred alternative and have three major differences of opinion. They propose trenches across the site rather than extraction wells, a soil cover rather than a multi-layer cap, and a smaller volume of "hot spot" soils 3000 c.y. versus the 32,000 c.y. Without further information, it is our technical and legal opinion that the PRP's proposal is not acceptable. However, it appears that the PRPs are in


BURIED TANKS
US ROUTE 224
OHIO STATE ROUTE 225
SCALE HOUSE
COAL TIPPLE REMAINS
ABANDONED BUILDINGS
ABANDONED INCINERATOR
ABANDONED BUILDINGS
EXISTING SOUTH DITCH
MW
RELOCATED WATSON RESIDENCE
THERMAL TREATMENT UNIT
100'
TYPICAL UPPER INTERMEDIATE UNIT EXTRACTION WELL SPACING
RUNOFF MONITORING LOCATION
WATER TREATMENT UNIT
REROUTED SOUTH DITCH
CEMENT PLANT PROPERTY
CEMENT PLANT STRUCTURES
SCALE
0
125
250 FEET
LEGEND
AREA OF MULTI-LAYER CAP/WATER TABLE EXTRACTION WELLS ON 50' GRID
SLURRY WALL
SITE FENCE DELINEATING AREA OF DEED RESTRICTIONS
ONSITE STRUCTURES REMOVAL
APPROXIMATE LIMITS OF "HOT SPOT" SOIL
RUNOFF MONITORING LOCATION
MW
WATER TABLE MONITORING WELL
MW
INTERMEDIATE UNIT MONITORING WELL
MW
UPPER SHARON AQUIFER MONITORING WELL
POTENTIAL AREAS OF BURIED DRUMS
ESTIMATED AREA OF CONTAMINATED GROUNDWATER IN UPPER INTERMEDIATE UNIT/UPPER INTERMEDIATE UNIT EXTRACTION WELLS ON 100' GRID
N
0
125
250
SCALE IN FEET APPROXIMATE

ALTERNATIVE 5
THERMAL TREATMENT
OF "HOT SPOT" SOIL
SITE PLAN
SUMMIT NATIONAL FS

FIGURE 3

Reproduced from best available copy.

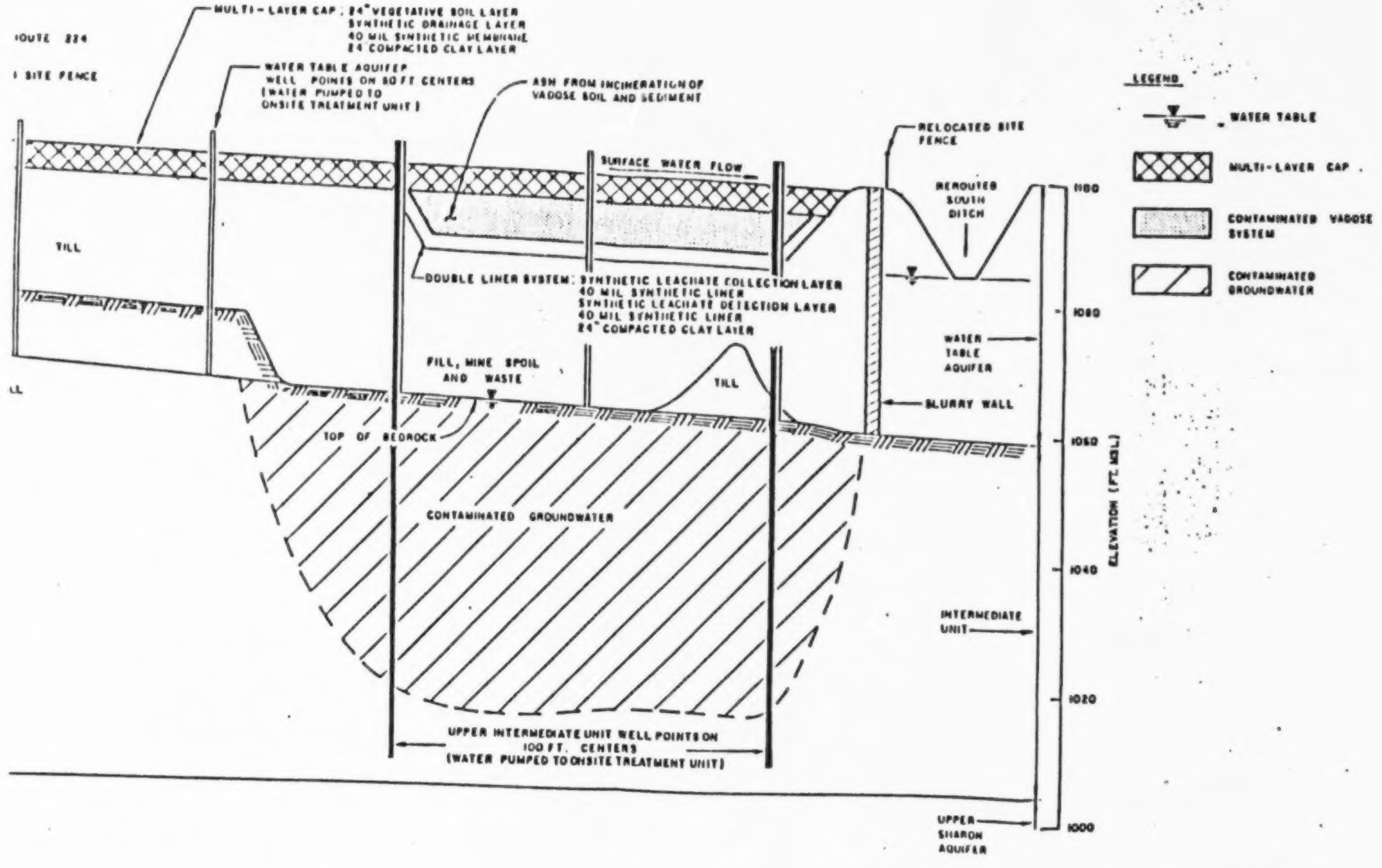

MULTI-LAYER CAP: 24" VEGETATIVE SOIL LAYER
SYNTHETIC DRAINAGE LAYER
40 MIL SYNTHETIC MEMBRANE
24 COMPACTED CLAY LAYER
IOUTE 224
I SITE FENCE
WATER TABLE AQUIFER
WELL POINTS ON 50 FT CENTERS
(WATER PUMPED TO
ONSITE TREATMENT UNIT)
ASH FROM INCINERATION OF
VADOSE SOIL AND SEDIMENT
SURFACE WATER FLOW
RELOCATED SITE
FENCE
REROUTED
SOUTH
DITCH
TILL
DOUBLE LINER SYSTEM: SYNTHETIC LEACHATE COLLECTION LAYER
40 MIL SYNTHETIC LINER
SYNTHETIC LEACHATE DETECTION LAYER
40 MIL SYNTHETIC LINER
24" COMPACTED CLAY LAYER
FILL, MINE SPOIL
AND WASTE
TILL
LL
TOP OF BEDROCK
WATER
TABLE
AQUIFER
SLURRY WALL
CONTAMINATED GROUNDWATER
INTERMEDIATE
UNIT
UPPER INTERMEDIATE UNIT WELL POINTS ON
100 FT. CENTERS
(WATER PUMPED TO ONSITE TREATMENT UNIT)
UPPER
SHARON
AQUIFER
1100
1080
1060
1040
1020
1000
ELEVATION (FT. MSL)
LEGEND
WATER TABLE
MULTI-LAYER CAP
CONTAMINATED VADOSE SYSTEM
CONTAMINATED GROUNDWATER

FIGURE 4

ALTERNATIVE 5 - THERMAL
TREATMENT OF "HOT SPOT" SOIL
GENERALIZED NORTH - SOUTH
CROSS SECTION
SUMMIT NATIONAL FS

favor of the remaining components. Although, negotiations appear favorable, to date the PRP group has not made a commitment that can guarantee their willingness to conduct the remedial design/remedial action.

Region V

The relocation of a resident has been a concern since such action has not been conducted within the region. The justification for relocating and purchasing 4 acres of property is based on unacceptable short and long term risks, and implementability of the remedial alternative. U.S. EPA headquarters was consulted and does not pose an objection. The agency in charge of managing negotiations is the Federal Emergency Management Agency (FEMA). Once the ROD is signed, an Interagency Agreement between U.S. EPA and FEMA can be developed to initiate the planning, terms, and costs of the relocation and acquisition. U.S. EPA's legal staff, office of public affairs, and project manager would assist as necessary during the process. FEMA will work closely with the State of Ohio since the State must concur and obtain title of the property.